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Development Center

Airfield Pavement Evaluation, Volk Field, Air National Guard, Camp Douglas, Wisconsin

Lucy D. Phillips and Robert W. Grau

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**Geotechnical and Structures
Laboratory**



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Lucy D. Phillips, Robert W. Grau

*Geotechnical and Structures Laboratory
U.S. Army Engineer Research and Development Center
3909 Halls Ferry Road
Vicksburg, MS 39180-6199*

Final report

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ABSTRACT: An airfield pavement evaluation was performed in August 2002 at Volk Field, Air National Guard (VFANG), Camp Douglas, Wisconsin, to develop information pertaining to the structural adequacy of the airfield pavements for continued use under its current mission and the upgrading of the pavements for mission changes. The pavement surface condition was evaluated using the Pavement Condition Index (PCI) survey procedure, and a nondestructive evaluation procedure was used to determine the load-carrying capability of the pavements and overlay requirements for continued use of the pavements under current missions. Results of the evaluation are presented including: (a) a tabulation of the existing pavement features, (b) the results of the nondestructive tests performed using a heavy weight deflectometer, (c) the PCI and rating of the surface of each pavement feature, (d) a structural evaluation and overlay requirements for 1,400 passes of the B-737 aircraft on the PCC pavements and 9,525 passes of the KC-135 aircraft on the AC pavements, (e) the pavement classification number for each pavement facility, and (f) maintenance and repair recommendations based on the structural evaluation and condition survey.

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Executive Summary

Personnel of the U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, MS, conducted the field testing at Volk Field, Air National Guard (VFANG), Camp Douglas, Washington, during August 2002. The structural capacity and physical properties of the pavement facilities were determined from nondestructive tests using a heavy weight deflectometer (HWD) and from measurements taken in previous studies. A visual inspection was also conducted to establish the condition of the airfield surface, which does not necessarily correspond to its load-carrying capacity.

The results of the tests and visual inspection reveal the following:

- a.* The primary airfield pavement facilities and their assigned Pavement Classification Number (PCN) are shown in Illustration 1.
- b.* All runway features, fifteen of the eighteen taxiway features, and nine of twelve apron features are structurally adequate to withstand the day-to-day mission traffic for 20 years.
- c.* Three (T7B, T11A, and T14B) of the eighteen taxiway features and three (A1B, A11D, and A14B) of the twelve apron features are structurally inadequate to withstand the projected fixed-wing day-to-day mission (i.e., peacetime use) traffic.
- d.* Installation Status Report (ISR) ratings for the airfield are shown in Illustration 2.
- e.* Approximately \$400,000 (FY03) for repair is required to improve the surfaces of four taxiway features (T3C, T6A, T7B, and T14B) and one apron feature (A14B) to meet the minimum PCI requirements.
- f.* In planning structural improvements and/or reconstruction requirements, it should be recognized that UFC 3-260-02 (Headquarters, Departments of the Army, Navy, and the Air Force 2001b) specifies that the following pavements be rigid pavement: all paved areas on which aircraft or helicopters are regularly parked, maintained, serviced, or preflight checked, on hangar floors and access aprons; on runway ends (305 m (1,000 ft)) of a Class B runway; primary taxiways for Class B runways; hazardous cargo, power check, compass calibration, warmup, alert, arm/disarm, holding, and washrack pads; and any other area where it can be documented that a flexible pavement will be damaged by jet blast or by spillage of fuel or hydraulic fluid.

- g.* Overloading the pavement facilities may shorten the life expectancy.
- h.* In order to be in concurrence with AR 420-72 (Headquarters, Department of the Army 2000) a condition survey of the airfield pavements will be required in 2006 and a structural evaluation including nondestructive testing in 2010.

Additional details on structural capacity, surface condition, and work required to maintain and strengthen the airfield are contained in Chapters 2 and 3 of this report.

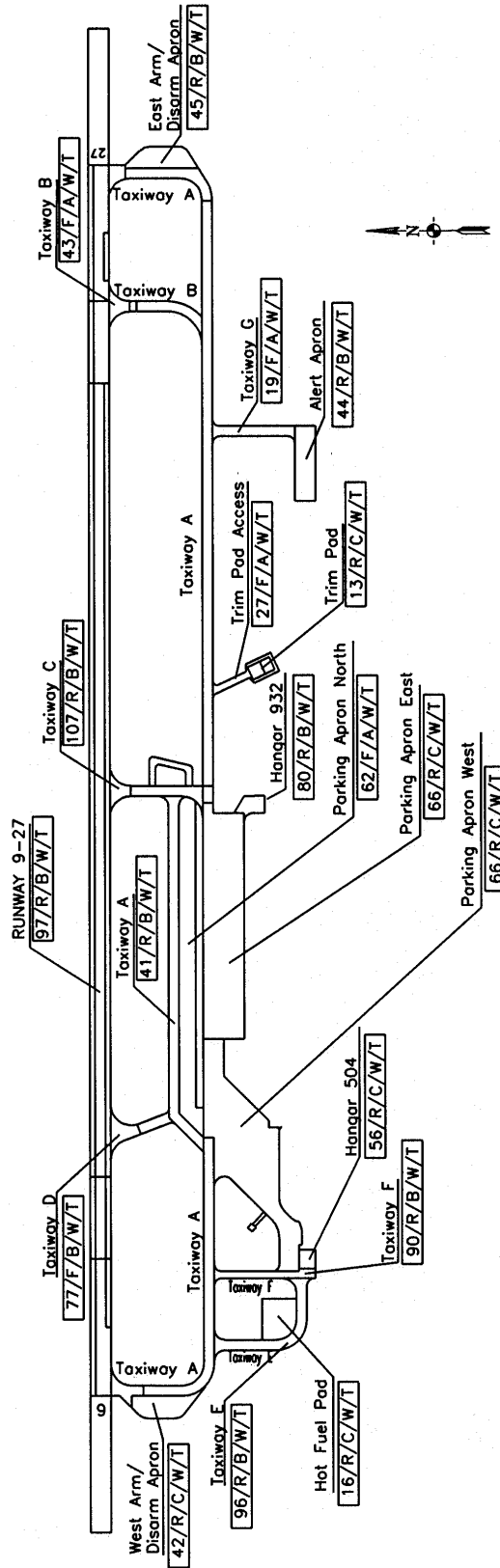


Illustration 1. Airfield Pavement Evaluation Chart (APEC)

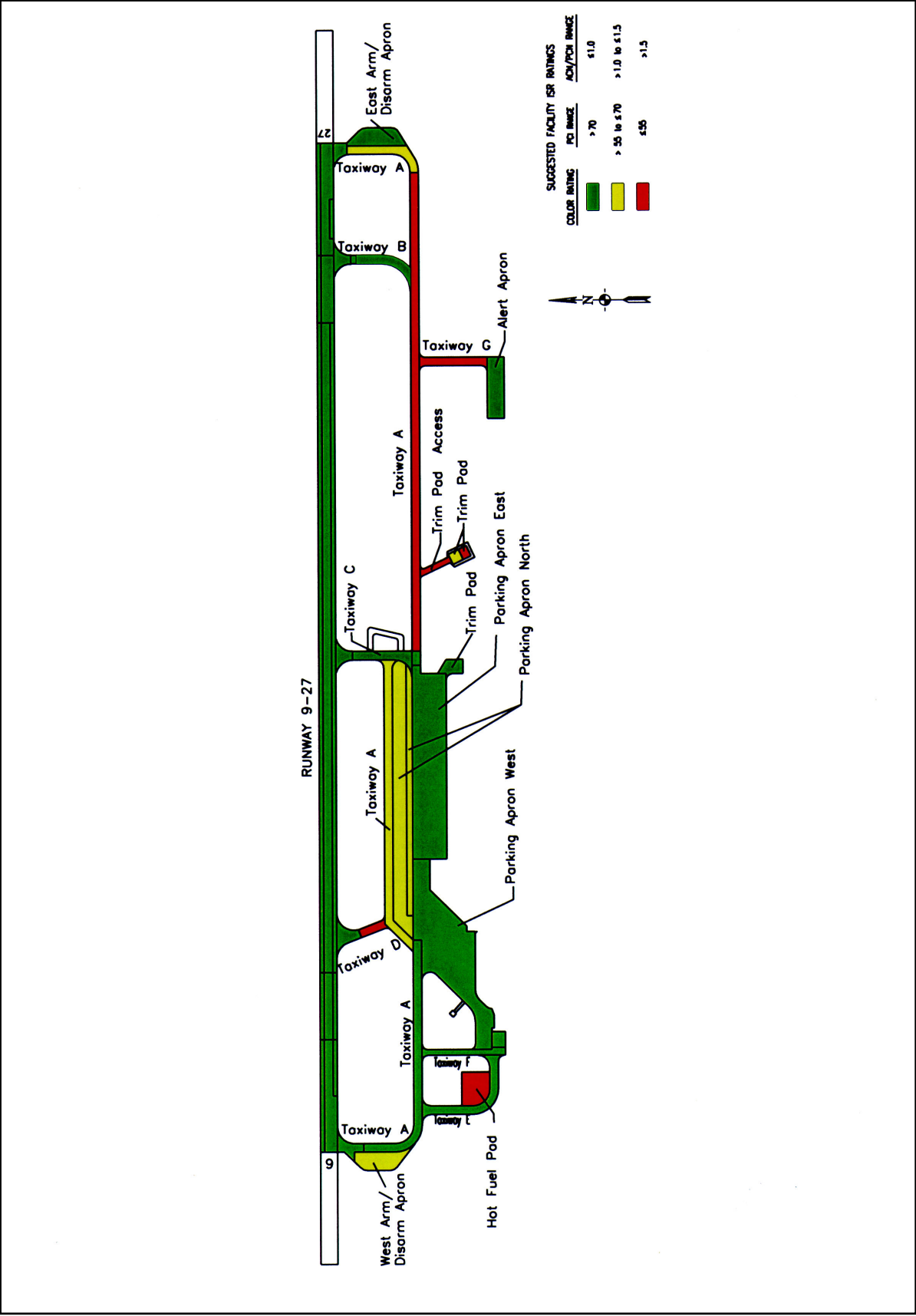


Illustration 2. Airfield pavement ISR ratings

Preface

The purpose of this report is to provide an assessment of load-carrying capacity and condition of airfield pavements at Volk Field, Air National Guard (VFANG), Camp Douglas, Wisconsin. This report provides data for the following:

- a. Planning and programming pavement maintenance, repairs, and structural improvements.
- b. Designing maintenance, repair, and construction projects.
- c. Determining airfield operational capabilities.
- d. Providing information for aviation flight publications and mission planning.

Users of information from this report include the installation's Directorate of Installation Support (DIS), engineering design agencies (DIS's, U.S. Army Corps of Engineers), Airfield Commanders, U.S. Army Aeronautical Services Agency, and agencies assigned operations planning responsibilities. Information concerning aircraft inventory, passes, and operations shall not be released outside U.S. Government agencies. This report satisfies requirements for condition inspection and structural evaluation established in Army Regulation AR 420-72 (Headquarters, Department of the Army 2000) and supports airfield survey requirements identified in Army Regulation AR 95-2 (Headquarters, Department of the Army 1990).

The Army Airfield Pavement Evaluation Program is sponsored and technically monitored by the U.S. Army Corps of Engineers, Transportation Systems Center (CENWO-ED-TX), located in Omaha, NE. The U.S. Army Forces Command, Fort McPherson, Georgia, provided funding for this investigation.

Personnel of the U.S. Army Engineer Research and Development Center (ERDC), Geotechnical and Structures Laboratory (GSL), Vicksburg, MS, prepared this publication. The findings and recommendations presented in this report are based upon pavement structural testing, data analysis, and condition survey work at VFANG. The required field testing was conducted in July 2002. The evaluation team consisted of Messrs. Robert W. Grau, Dan D. Mathews, and Patrick S. McCaffrey, Jr. and Ms. Lucy D. Phillips, Airfield and Pavements Branch (APB), GSL. Ms. Phillips and Mr. Grau prepared this publication under the supervision of Mr. Don R. Alexander, Chief, APB; Dr. Albert J. Bush III,

Chief, Engineering Systems and Materials Division; and Dr. David W. Pittman, Acting Director, GSL.

Commander and Executive Director of ERDC was COL John W. Morris III, EN. Dr. James R. Houston was Director.

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1 Introduction

Background

In May 1982 the Department of the Army initiated a program to determine and evaluate the physical properties, the load-carrying capacity for various aircraft, and the general condition of the pavements at major U.S. Army Airfields (AAFs). This program was established at the request of the Major Army Commands (FORSCOM, TRADOC, and AMC). Headquarters, U.S. Army Corps of Engineers (CECW-EW) sponsors a program for periodic evaluation of Army Airfield facilities in accordance with Army Regulation AR 420-72 (Headquarters, Department of the Army 2000). All Category 1 AAFs and instrumented U.S. Army Heliports (AHPs) are included in the CECW-EW program. The evaluation of the airfield pavements was performed to determine the structural adequacy of the existing pavements to accommodate mission aircraft. Results of this evaluation were also used to identify maintenance, repair, and major repair work requirements and to help establish Installation Status Report (ISR) ratings. The U.S. Army Forces Command, Fort McPherson, Georgia provided funding for this investigation. Results of this investigation will provide current information for designing upgrades to the pavement facilities.

Objective and Scope

The primary objectives of this investigation were to determine the allowable aircraft loads and design traffic, and to identify maintenance, repair, and structural improvement needs for each airfield pavement feature. These objectives were accomplished by:

- a. Obtaining records of day-to-day traffic operations from the installation Airfield Commander.
- b. Conducting a structural evaluation of the airfield pavements in accordance with UFC 3-260-03 (Headquarters, Departments of the Army, Navy, and the Air Force 2001a) using the nondestructive testing device.
- c. Performing a condition survey to determine pavement distresses (type, severity and magnitude) in accordance with ASTM D 5340-93 and using analysis features of the Micro PAVER pavement management system.

The results of this study can be used to:

- a.* Provide preliminary engineering data for pavement design (Appendixes A and B).
- b.* Assist in identifying and forecasting maintenance and repair work, the preparation of long range work plans, and programming funds for the various work classification categories (Appendixes C and E).
- c.* Determine type and gross weights of aircraft that can operate on a given airfield feature without causing structural damage or shortening the life of the pavement structure (Appendix D).
- d.* Determine aircraft operational constraints as a function of pavement strength and surface condition (Appendix D).
- e.* Determine the need for structural improvements to sustain current levels of aircraft operations (Appendix D).
- f.* Summarize results for ISR ratings (Executive Summary).

Chapter 2 of this report includes the results of the aircraft classification number-pavement classification number (ACN-PCN) analysis for use by U.S. Army Aeronautical Services Agency (USAASA), the airfield commander, and Deputy Chief of Staff for Operations and Plans (DCSOPS) personnel. Chapter 3 contains maintenance, repair, and structural improvement recommendations for use by Directorate of Installation Support (DIS) personnel and design agencies. Chapter 4 contains conclusions and recommendations in summary form. Detailed supporting data are provided in the appendices.

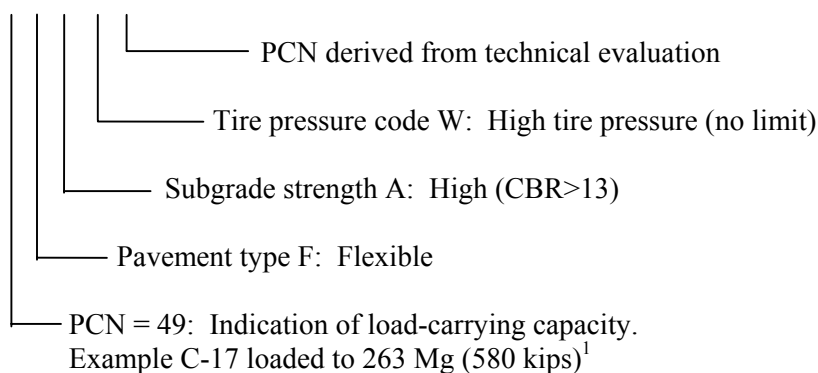
2 Pavement Load-Carrying Capacity

General

The load-carrying capacity is a function of the strength of the pavement, the gross weight of the aircraft, and the number of applications of the load. The method used to report pavement load-carrying capacity is the ACN-PCN system as adopted by the International Civil Aviation Organization (ICAO). The United States, as a participating member of ICAO, is required to report pavement strength in this format. The ACN-PCN format also provides the airfield evaluation information required by Army Regulation AR 95-2 (Headquarters, Department of the Army 1990).

The ACN and PCN are defined as follows: The ACN is a number which expresses the relative structural effect of an aircraft on both flexible and rigid pavements for specific standard subgrade strengths in terms of a standard single wheel load. The PCN is a number which expresses the relative load-carrying capacity of a pavement for a given pavement life in terms of a standard single wheel load. An example of a PCN five part code is as follows:

49/F/A/W/T



¹ Most of the dimensions and measurements reported were obtained in non-SI units. All such values have been converted using the conversion factors given in ASTM E 621.

The system works by comparing the ACN to the PCN. The PCN is a representation of the allowable load for a specified number of repetitions over the life of a pavement. The ACN is a representation of the load applied by an aircraft using the pavement. The system is structured such that an aircraft operating at an ACN (applied load) equal to or less than the PCN (allowable load) would comply with load restrictions established based on a specified design life for the pavement facility. If, however, the ACN (applied load) is greater than the PCN (allowable load), the specified design life will be shortened due to this overloading. Pavements can usually support some overload; however, pavement life is reduced. As a general rule, ACN/PCN ratios of up to 1.25 have minimal impact on pavement life. If the ACN/PCN ratio is between 1.25 and 1.50, aircraft operations should be limited to 10 passes, and the pavement inspected after each operation. Aircraft operations resulting in an ACN/PCN ratio over 1.50 should not be allowed except for emergencies.

Load-Carrying Capacity

The first step in determining the load-carrying capacity of the pavements at Volk Field, Air National Guard (VFANG), Camp Douglas, Wisconsin, was to estimate the traffic to which the airfield will be subjected over the next 20 years. The traffic mix established for the primary airfield facilities; Runway 9-27, Taxiways A, B, C, E, F, G, and Trim Pad Access, and all parking aprons/ramps is shown in Table A4. Based on this mix, the critical aircraft operating on the airfield was determined to be the B-737 aircraft at a design pass level of 1,400 for PCC pavements and the KC-135 at a design pass level of 9,525 for AC pavements as shown in Table D1. Using this traffic information, and results of the data analysis, the ACN value for the critical aircraft operating on the VFANG pavements was determined. The operational ACN for the airfield is 45/R/B/W/T for the rigid pavements and 36/F/A/W/T for the flexible pavements. See Table D5 for description of the five component ACN or PCN code. The numerical ACN values calculated for the critical aircraft operating on AC and PCC pavements on each of the four subgrade categories are presented in Table D2.

The critical PCN value for each airfield facility is presented in the Airfield Pavement Evaluation Chart (APEC) in Illustration 1. A summary of allowable loads and overlay requirements determined for the critical aircraft and its design pass level is shown in Table D3. PCN codes for the controlling feature of each facility are presented in Table D4. The effects of thaw-weakened conditions were considered and the results summarized in Table D4.

The number of passes of mobilization and contingency aircraft loadings that could be sustained by each facility is dependent on the ACN of the aircraft and the critical PCN of the facility. During wartime, many aircraft are allowed to carry heavier loads than during peacetime. This allowance means that the aircraft would have a higher ACN because of the higher loading and would cause more damage per pass than in peacetime. Also, under some contingency plans or during emergencies, heavier aircraft than those in the traffic table, see Table A4, could be considered for using the airfield pavements. These heavier aircraft would generally have higher ACN values and cause more damage than those nor-

mally using the airfield. The operational life of the pavement will be reduced if it is subjected to aircraft loadings having ACN values higher than the PCN of the facility. An example of a procedure to determine the impact of mobilization and contingency aircraft operations is presented in Appendix D.

3 Recommendations for Maintenance, Repair, and Structural Improvements

General

Recommendations for maintenance, repair, and structural improvements are based on results from both the structural evaluation (Appendix D) and the pavement condition survey (Appendix C). Either or both the evaluation and/or the survey may indicate that a particular feature needs repair and/or improvement. If the pavement condition index (PCI) is below the required value contained in Army Regulation AR 420-72 (Headquarters, Department of the Army 2000), the pavement needs maintenance to improve its surface condition. If the ACN/ PCN ratio determined for the critical aircraft is greater than one, the pavement needs structural improvement. Where both evaluations indicate improvements are needed, the recommendations are made such that the repairs to the surface are those needed until the structural improvements can be made. If the structural improvements are made first, the surface repairs may not be necessary. The PCI, ACN/PCN, ISR rating, and recommended general maintenance alternatives for each feature are shown in Table 3-1, the Airfield Pavement Evaluation General Summary. Specific recommendations for maintenance are identified in Table 3-2.

The ISR is an information system designed to help the Army monitor some of the basic elements that affect the quality of life on installations. The ISR also supports decision-making by giving managers an objective means and a common methodology for comparing conditions across installations and across functional areas.

Recommendations for structural improvements have been defined in terms of overlays in this report. In some instances, overlays may not be the most cost effective or best engineering alternative for pavement strengthening. It should be noted that the overlay requirements shown in Table 3-2 were determined based on representative conditions at the time of testing and should be considered minimum values until verified by further investigation. These overlays should be used as a guide when programming funds for design projects. Prior to advertising an improvement project, a thorough pavement analysis and design should be completed to select the most cost-effective improvement technique. All designs should be reviewed by the U.S. Army Corps of Engineers

Transportation Systems Center to ensure that they are in accordance with current design criteria.

Recommended overlay thicknesses follow the criteria for minimum thicknesses contained in UFC 3-260-02 (Headquarters, Departments of the Army, Navy, and the Air Force 2001b). Where calculated thicknesses are greater than the required minimum thickness, the values were rounded up to the next higher 13 mm (1/2-in.).

Maintenance and repair (M&R) recommendations are based on the changes needed to provide the minimum required PCI. AR 420-72 (Headquarters, Department of the Army 2000) states that installation airfield pavements shall be maintained to at least the following PCI:

All runways > 70
Primary taxiways < 60
Aprons and secondary taxiways > 55

Recommendations

Steps 1 through 5 of the flow chart shown in Figure 3-1 were used in determining the recommendations suggested in Table 3-2. The M&R alternatives suggested for the existing surfaces were selected from those listed for various distresses in flexible pavements shown in Table 3-3 and rigid pavements shown in Table 3-4. In many instances, the performance of a specific alternative depends upon the geographical location and expertise of local contractors. Therefore, it is suggested that the local DIS personnel review all recommendations. Local costs for the approved alternatives can then be used with the Micro PAVER program to obtain a reasonable cost estimate. All overlay, repair, or major repair should be in accordance with UFC 3-269-02 (Headquarters, Departments of the Army, Navy, and the Air Force 2001b) that specifies that the following pavements be rigid pavement: all paved areas on which aircraft or helicopters are regularly parked, maintained, serviced, or preflight checked, on hangar floors and access aprons; on runway ends (305 m (1,000 ft) of a Class B runway; primary taxiways for Class B runways; hazardous cargo, power check, compass calibration, warmup, alert, arm/disarm, holding, and washrack pads; and any other area where it can be documented that a flexible pavement will be damaged by jet blast or by spillage of fuel or hydraulic fluid.

The PCI was developed to determine maintenance and repair needs. If the PCI is low, maintenance or repair is needed to increase the PCI. If the PCI is low and the PCN is greater than the ACN, localized maintenance or repair will generally be an acceptable solution. Although these maintenance activities and repairs will improve the PCI to acceptable levels, they may not be the most cost-effective alternative. An overlay or other overall improvement may be more cost-effective than considerable localized maintenance or repairs. Certainly, if the current PCI is less than 25, overall improvements should be investigated. When an overlay is recommended, the maintenance recommended is that which is needed to keep the pavement serviceable and safe and its PCI at the required

minimum until the overlay is applied. The PCN is used to specify the structural capability of an airfield pavement. If the design aircraft's ACN is larger than the computed PCN, the pavement is structurally inadequate to support the mission traffic. If only repairs to improve the PCI are applied, the pavement could deteriorate quite rapidly. Structural improvements are required to increase the load-carrying capacity so that the PCN is greater than or equal to the ACN (aircraft load). Even if the PCI is high, structural improvements are necessary to support the mission traffic if the PCN is less than the design ACN.

The PCIs of five pavement features (T3C, T6A, T7B, T14B, and A14B) fail to meet the minimum acceptable level outlined above. To meet the minimum PCI requirements crack sealing and patching are recommended for T3C, T6A, T7B, T14B, and A14B. The estimated cost to upgrade these five features is approximately \$400,000 FY03 dollars. An airfield pavements cost estimating guide for various maintenance and repair alternatives is shown in Table 3-5.

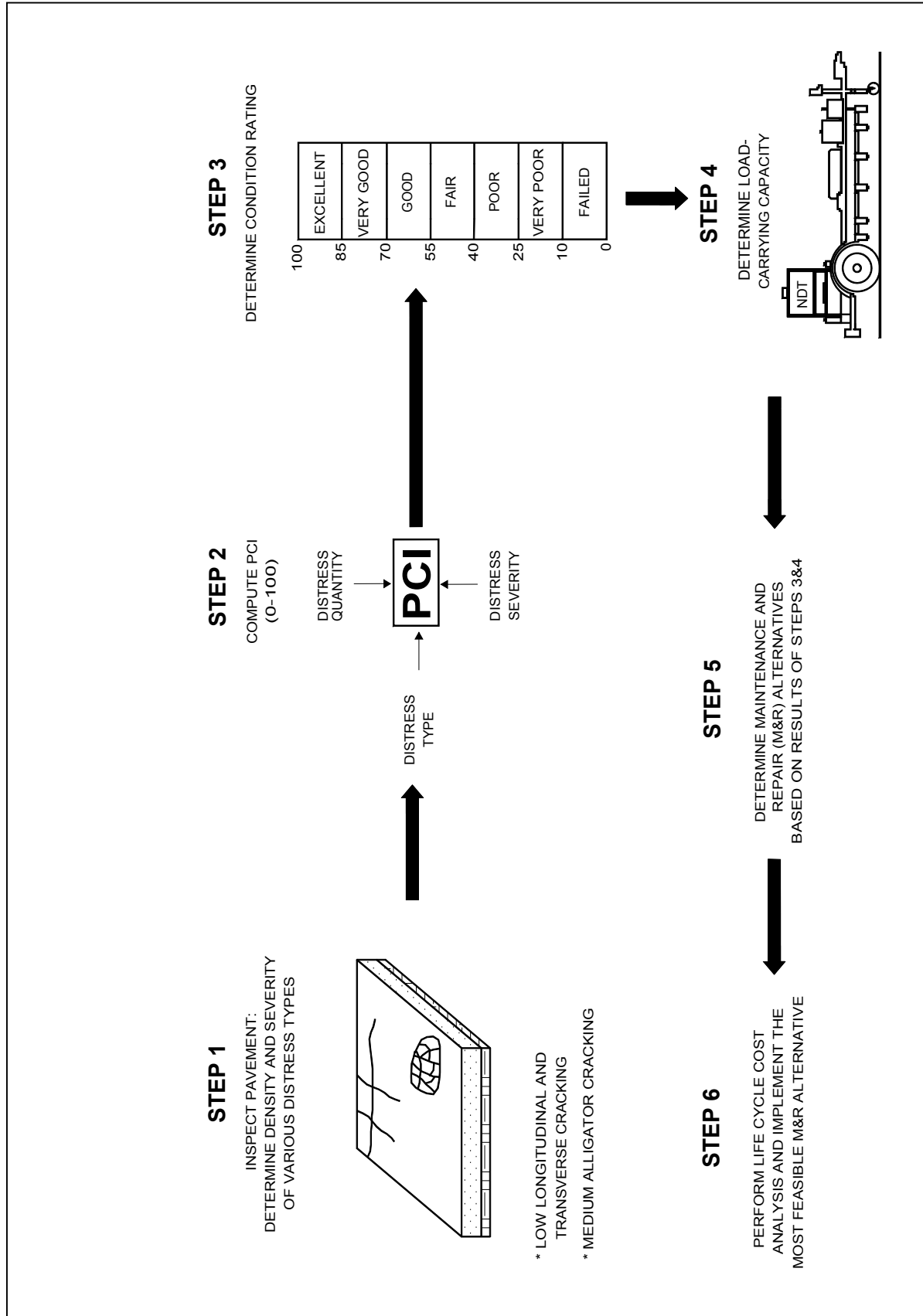


Figure 3-1. Flowchart for determination of maintenance and repair recommendations

Table 3-1
Airfield Pavement Evaluation General Summary

Pavement Feature	PCI	ACN/PCN ²	ISR Rating ³	Work Classification ¹			
				Do Nothing	Maintenance	Repair	Major Repair
R1A	100	0.46	Green	X			
R2D	98	NA ⁴	Green	X			
R3C	100	0.38	Green	X			
R4D	99	NA ⁴	Green	X			
R5C	100	0.31	Green	X			
R6D	99	NA ⁴	Green	X			
R7C	100	0.38	Green	X			
R8D	99	NA ⁴	Green	X			
R9A	99	0.43	Green	X			
R10D	99	NA ⁴	Green	X			
T3C	53	0.43	Red			X	
T4A	63	0.60	Amber		X		
T6A	47	0.80	Red			X	
T7B	38	1.89	Red			X	
T9C	100	0.84	Green	X			
T11A	83	1.10	Amber	X			
T14B	35	1.33	Red			X	
T15A	100	0.49	Green	X			
T16C	100	0.52	Green	X			
T17C	100	0.36	Green	X			
T18C	96	0.38	Green	X			
T19A	100	0.46	Green	X			
T20C	100	0.30	Green	X			
T21A	87	0.67	Green	X			
T22C	99	0.47	Green	X			
T23C	91	0.50	Green	X			

(Continued)

¹ Work is categorized for preliminary planning purposes only. Classification of work for administrative approval is an installation responsibility. Policy guidance for airfield pavements is provided in AR 420-72. *Maintenance* is usually performed on paved areas with a PCI greater than the minimum required and encompasses primarily the day-to-day routine work. Maintenance includes items such as sealing cracks and joints, repairing potholes, patching, repairing spalls, and applying rejuvenators. *Repair* is the restoration of a failed or rapidly deteriorating section of pavement to a good or excellent condition to such that it may be utilized for its designated purpose. Repair is usually applied to pavements with a PCI less than the minimum required. Examples are: recycling, overlays, slab replacement, and repairing drainage structures. *Major repair (construction)* relates to the alteration, extension, replacement, or upgrading of an existing facility. Major repair examples include: widening or lengthening a surfaced area, strengthening a pavement to support a new mission, and replacement of an entire facility.

² Determined for design aircraft.

³ Based on the PCI and ACN/PCN ratio of the pavement feature.

⁴ Features were not evaluated for load because the outside edges do not receive aircraft traffic.

Table 3-1 (Concluded)							
Pavement Feature	PCI	ACN/PCN ²	ISR Rating ³	Work Classification ¹			
				Do Nothing	Maintenance	Repair	Major Repair
T24C	94	0.42	Green	X			
T25A	97	0.58	Green	X			
A1B	93	1.12	Amber			X	
A3C	89	0.84	Green	X			
A5B	67	0.51	Amber		X		
A6B	87	1.00	Green		X		
A7B	91	1.00	Green	X			
A8B	61	0.90	Amber			X	
A9B	97	0.56	Green	X			
A10B	95	0.71	Green	X			
A11D	76	2.94	Red			X	
A12B	67	0.58	Amber		X		
A13B	92	0.71	Green	X			
A14B	35	3.62	Red			X	
<p>Work is categorized for preliminary planning purposes only. Classification of work for administrative approval is an installation responsibility. Policy guidance for airfield pavements is provided in AR 420-72. <i>Maintenance</i> is usually performed on paved areas with a PCI greater than the minimum required and encompasses primarily the day-to-day routine work. Maintenance includes items such as sealing cracks and joints, repairing potholes, patching, repairing spalls, and applying rejuvenators. <i>Repair</i> is the restoration of a failed or rapidly deteriorating section of pavement to a good or excellent condition to such that it may be utilized for its designated purpose. Repair is usually applied to pavements with a PCI less than the minimum required. Examples are: recycling, overlays, slab replacement, and repairing drainage structures. <i>Major repair (construction)</i> relates to the alteration, extension, replacement, or upgrading of an existing facility. Major repair examples include: widening or lengthening a surfaced area, strengthening a pavement to support a new mission, and replacement of an entire facility.</p> <p>² Determined for design aircraft.</p> <p>³ Based on the PCI and ACN/PCN ratio of the pavement feature.</p>							

Table 3-2 Summary of Overlay and Maintenance Requirements for the Day-to-Day Traffic Operations					
Feature	Area Sq m (sq yd)	Overlay Requirements, mm (in.) ¹			Maintenance and Repair Alternatives for Existing Surfaces
		AC	PCC Partial Bond	PCC with no Bond	
Runway 9-27					
R1A ²	8 640 (10,333)	NA	0 (0.0)	0 (0.0)	None required at this time.
R2D ²	5 226 (6,250)	3 --	3 --	3 --	None required at this time.
R3C	4 181 (5,000)	NA	0 (0.0)	0 (0.0)	None required at this time.
R4D	4 181 (5,000)	3 --	3 --	3 --	None required at this time.
R5C	40 413 (48,333)	0 (0.0)	NA	See ⁴	None required at this time.
R6D	40 413 (48,333)	3 --	3 --	3 --	None required at this time.
R7C	6 271 (7,500)	NA	0 (0.0)	0 (0.0)	None required at this time.
R8D	2 090 (2,500)	3 --	3 --	3 --	None required at this time.
R9A	9 262 (11,083)	NA	0 (0.0)	0 (0.0)	None required at this time.
R10D	4 668 (5,538)	3 --	3 --	3 --	None required at this time.
Taxiway A					
T4A ²	18 2550 (22,329)	0 (0.0)	NA	See ⁴	The PCI of this feature is above that required for taxiways. However, it is recommended that all medium- and high-severity cracks be cleaned and then sealed with a high quality crack sealant. ⁵
T6A ²	29 255 (35,758)	0 (0.0)	NA	See ⁴	Increase the PCI to an acceptable level by cleaning and sealing all medium- and high-severity cracks with a high quality crack sealant ⁵ and that full-depth patches be applied to correct the alligator cracked areas and all medium- and high-severity depressions.
T11A ²	5 229 (6,253)	NA	152 (6.0)	178 (7.0)	Retain the PCI at an acceptable level by cleaning and sealing all medium- and high-severity cracks with a high quality crack sealant. ⁵ Structural improvements are required.
T15A ²	2 438 (2,917)	NA	0 (0.0)	0 (0.0)	None required at this time.
(Sheet 1 of 4)					
<div>1 For planning purposes only.</div> <div>2 UFC 3-260-02 (Headquarters, Departments of the Army, Navy, and the Air Force 2001b) requires that the surface be concrete.</div> <div>3 Edges were not evaluated for load-carrying capacity.</div> <div>4 Was not calculated because feature was evaluated as a flexible pavement.</div> <div>5 See TM 5-882-11/AFP 88-6, Chapter 7 (Headquarters, Departments of the Army and Air Force 1993) for guidance.</div>					

Table 3-2 (Continued)					
Feature	Area Sq m (sq yd)	Overlay Requirements, mm (in.)¹			Maintenance and Repair Alternatives for Existing Surfaces
		AC	PCC Partial Bond	PCC with no Bond	
T19A ²	1 563 (1,870)	NA	0 (0.0)	0 (0.0)	None required at this time.
T21A ²	15 503 (18,542)	NA	0 (0.0)	0 (0.0)	None required at this time.
T25A ²	871 (1,042)	NA	0 (0.0)	0 (0.0)	None required at this time.
Taxiway B					
T9C	3 135 (3,750)	0 (0.0)	NA	See ⁴	None required at this time.
T18C	2 230 (2,662)	NA	0 (0.0)	0 (0.0)	None required at this time.
T20C	209 (250)	0 (0.0)	NA	See ⁴	None required at this time.
Taxiway C					
T17C	3 650 (4,375)	NA	0 (0.0)	0 (0.0)	None required at this time.
T24C	1 452 (1,736)	NA	0 (0.0)	0 (0.0)	None required at this time.
Taxiway D					
T3C	1 672 (2,000)	0 (0.0)	NA	See ⁴	Increase the PCI to an acceptable level by cleaning and sealing all medium- and high-severity cracks with a high quality crack sealant ⁵ and by applying full-depth patches to correct the rutted areas and all medium- and high-severity depressions.
T16C	1 777 (2,125)	0 (0.0)	NA	See ⁴	None required at this time.
Taxiway E					
T22C	7 142 (8,542)	NA	0 (0.0)	0 (0.0)	None required at this time.
Taxiway F					
T23C	3 437 (4,110)	NA	0 (0.0)	0 (0.0)	None required at this time.
(Sheet 2 of 4)					
¹ For planning purposes only. ² UFC 3-260-02 (Headquarters, Departments of the Army, Navy, and the Air Force 2001b) requires that the surface be concrete. ³ Edges were not evaluated for load-carrying capacity. ⁴ Was not calculated because feature was evaluated as a flexible pavement. ⁵ See TM 5-882-11/AFP 88-6, Chapter 7 (Headquarters, Departments of the Army and Air Force 1993) for guidance.					

Table 3-2 (Continued)

Feature	Area Sq m (sq yd)	Overlay Requirements, mm (in.) ¹			Maintenance and Repair Alternatives for Existing Surfaces
		AC	PCC Partial Bond	PCC with no Bond	
Taxiway G					
T7B	4 131 (5,000)	127 (5.0)	NA	See ⁴	Increase the PCI to an acceptable level by cleaning and sealing all medium-severity cracks with a high quality crack sealant ⁵ and by applying full-depth patches to correct the alligator cracked areas. Replace all medium severity patches. Structural improvements are required. PCC reconstruction should be considered if this feature is to withstand the projected traffic.
Trim Pad Access					
T14B	1 347 (1,611)	64 (2.5)	NA	See ⁴	Increase the PCI to an acceptable level by applying full-depth patches to correct the alligator cracked areas and all medium- severity depressions. Also clean all cracks and remove all loose material, and then seal the entire surface with an approved bituminous pavement sealer ⁴ (see PCASE on-line FACT SHEET web site for product guidance). Structural improvements are required. PCC reconstruction should be considered if this feature is to withstand the projected traffic.
West Arm/Disarm Apron					
A1B ²	6 151 (7,333)	NA	152 (6.0)	152 (6.0)	Although the PCI of this feature is above that required for aprons, it is recommended to full-depth patch all medium severity patches and corner spalls. Structural improvements are required.
Hangar 504 Apron					
A3C ²	1 561 (1,867)	NA	0 (0.0)	0 (0.0)	None required at this time.
Parking Apron North					
A5B ²	29 031 (34,722)	0 (0.0)	NA	See ⁴	The PCI of this feature is above that required for aprons, however, the weathering/raveling should be corrected within the next five years b sealing the entire surface with an approved bituminous pavement sealer (see the PCASE on-line FACT SHEET web site for product guidance).
A12B ²	10 405 (12,444)	0 (0.0)	NA	See ⁴	The PCI of this feature is above that required for aprons, however, the weathering/raveling should be corrected within the next five years b sealing the entire surface with an approved bituminous pavement sealer (see the PCASE on-line FACT SHEET web site for product guidance).
Alert Apron					
A6B ²	7 665 (9,167)	NA	0 (0.0)	0 (0.0)	The PCI of this feature is above that required for aprons. However, the medium- and high- severity spalls should be corrected with an epoxy patch.
East Arm/Disarm Apron					
A7B ²	6 358 (7,604)	NA	0 (0.0)	0 (0.0)	None required at this time.
(Sheet 3 of 4)					
¹ For planning purposes only.					
² UFC 3-260-02 (Headquarters, Departments of the Army, Navy, and the Air Force 2001b) requires that the surface be concrete.					
³ Edges were not evaluated for load-carrying capacity.					
⁴ Was not calculated because feature was evaluated as a flexible pavement.					
⁵ See TM 5-892-11/AFP 88-6, Chapter 7 (Headquarters, Departments of the Army and Air Force 1993) for guidance.					

¹ For planning purposes only.² UFC 3-260-02 (Headquarters, Departments of the Army, Navy, and the Air Force 2001b) requires that the surface be concrete.³ Edges were not evaluated for load-carrying capacity.⁴ Was not calculated because feature was evaluated as a flexible pavement.⁵ See TM 5-882-11/AFP 88-6, Chapter 7 (Headquarters, Departments of the Army and Air Force 1993) for guidance.

Table 3-2 (Concluded)					
Feature	Area Sq m (sq yd)	Overlay Requirements, mm (in.) ¹			Maintenance and Repair Alternatives for Existing Surfaces
		AC	PCC Partial Bond	PCC with no Bond	
Trim Pad					
A8B ²	929 (1,111)	NA	0 (0.0)	0 (0.0)	The PCI of this feature is above that required for aprons. However, shattered slabs be replaced.
A14B ²	697 (833)	NA	279 (11.0)	318 (12.5)	It is recommended that all medium-severity shattered slabs be cleaned and then sealed with a high quality crack sealant ⁵ or replaced. Full depth patch all medium- severity patches. Structural improvements are required.
Hangar 932 Apron					
A9C ²	1 412 (1,689)	NA	0 (0.0)	0 (0.0)	None required at this time.
Parking Apron East					
A10B ²	47 902 (57,292)	NA	0 (0.0)	0 (0.0)	None required at this time.
Hot Fuel Pad					
A11D ²	7 200 (8,611)	NA	229 (9.0)	267 (10.5)	The PCI of this feature is above that required for aprons. It is recommended to replace joint sealant. Epoxy patch all medium-and high- severity spalls. Structural improvements are required.
Parking Apron West					
A13B ²	44 308 (52,992)	NA	0 (0.0)	0 (0.0)	None required at this time.
(Sheet 4 of 4)					
¹ For planning purposes only.					
² UFC 3-260-02 (Headquarters, Departments of the Army, Navy, and the Air Force 2001b) requires that the surface be concrete.					
³ Edges were not evaluated for load-carrying capacity.					
⁴ Was not calculated because feature was evaluated as a flexible pavement.					
⁵ See TM 5-882-11/AFPM 88-6, Chapter 7 (Headquarters, Departments of the Army and Air Force 1993) for guidance.					

Table 3-3 Maintenance, Repair, and Major Repair Alternatives for Airfield Pavements, Flexible																			
Distress Type	Maintenance					Repair							Major Repair						
	Seal Minor Cracks	Repair Pot- Holes	Partial- Depth Patching	Apply Rejuve- nators ¹	Seal Major Cracks	Full- Depth Patching	Micro- Surfacing	Slurry Seal ²	Thin AC Overlays ³	Surface Milling	Grooving	Porous Friction Course	Repair Drainage Facilities ⁴	Surface Recycling	AC Structural Overlay ³	PCC Structural Overlay	Remove Existing Surface and Reconstruct	Hot Recycle	Cold Recycle
Alligator cracking	L	M,H	M			M,H	L	L					L,M,H		M,H	M,H	H		
Bleeding										A				A			A	A	A
Block cracking	L,M			L	M,H		L,M	L						M	M,H			M,H	M,H
Corrugation			L,M			L,M,H	L,M		M,H	L,M							M,H		
Depression			L,M,H			M,H	L		M,H				L,M,H				H		
Jet blast				A		A	A		A										
Reflection cracking	L,M				M,H		L,M	L							M,H			H	
Longitudinal and transverse cracking	L,M				M,H		L,M	L							M,H			H	
Oil spillage			A			A			A	A				A			A	A	
Patching	L,M		M		M	M,H									M,H		H	H	
Polished aggregate							A	A	A	A	A			A					
Raveling/weathering		M,H		L,M		M	L,M	L	M,H	M				M,H		H	H	M,H	
Rutting			L,M			L,M,H	L						L,M,H		M,H	H	H	M,H	
Shoving			L			L,M				L,M							M,H	M,H	
Slippage cracking	A		A		A	A									A		A	A	
Swell			L,M			M,H				L,M			L,M,H				H		

Note: L = low severity level, M = medium severity level, H = high severity level, A = no severity levels for this distress.

¹ Not to be used on high speed areas due to increased skid potential.

² Not to be used on heavy traffic areas.

³ Patch distressed areas prior to overlay.

⁴ Drainage facilities to be repaired as needed.

Note: L = low severity level; M = medium severity level; H = high severity level; A = no severity levels for this distress.

¹ Not to be used on high speed areas due to increased skid potential.

² Not to be used on heavy traffic areas.

³ Patch distressed areas prior to overlay.

⁴ Drainage facilities to be repaired as needed.

Table 3-4 Maintenance, Repair, and Major Repair Alternatives for Airfield Pavements, Rigid																
Distress Type	Maintenance						Repair						Major Repair			
	Seal Minor Cracks	Joint Seal	Partial Patch	Epoxy Patch	Seal Major Cracks	Full-Depth Patch	Under Sealing	Slab Grinding	Surface Milling	AC Overlay	PCC Overlay	Slab Replacement	Crack & Seal with AC Structural Overlay	AC Overlay w/ Geotextile	Repair/Install Surface/Subsurface Drainage System ¹	Remove Existing PCC and Reconstruct
Blowup			L,M			M,H						H				
Corner break	L			M,H	M,H	M,H						H				
Longitudinal/Transverse/	L,M				M,H					H		H	M,H	H	L,M,H	H
Diagonal cracking																
D cracking	L		M,H		M,H	H						H				H
Joint seal damage		M,H														
Patching (small) <5 ft ²	L,M		M	L,M	M,H	M,H						H				
Patching/utility cut	L,M		M	L,M	M,H	M,H						H				H
Popouts ²				A						A	A					
Pumping	A	A			A		A								A	
Scaling/map cracking			M,H					M,H		M,H	M,H					
Fault/settlement		L,M					M,H	L,M	M,H						L,M,H	
Shattered slab	L				L,M					M,H	M,H	M,H		H	L,M,H	H
Shrinkage crack ³																
Spalling (joints)		L	L,M	L,M,H	M,H	M,H										
Spalling (corner)			L,M	L,M	M,H	M,H										

Note: L = low severity level; M = medium severity level; H = high severity level; A = no severity levels for this distress.

¹ Drainage facilities to be repaired as needed.

² Popouts normally do not require maintenance.

³ Shrinkage cracks normally do not require maintenance.

Table 3-5 Airfield Pavements M&R Cost Estimating Guide								
Item	Description	U/M	Unit Cost (\$)					
			FY00	FY01	FY02	FY03	FY04	FY05
1	Remove/replace 10 in. PCC w/14 in. PCC including 6 in. base	SY	71.32	73.10	74.92	76.80	78.71	80.68
2	PCC Construction	SY-IN	3.64	3.73	3.87	3.92	4.02	4.12
3	Remove/replace 6 in. Bituminous Pavement w/14 in. PCC including 6 in. base	SY	65.38	67.01	68.69	70.41	72.17	73.97
4	Asphalt Concrete Overlay							
	-- Airfield Mix	TONS	50.34	51.60	52.89	54.21	55.57	56.95
		SY-IN	2.14	2.20	2.27	2.33	2.40	2.48
	-- Highway Mix	TONS	46.36	47.52	48.71	49.92	51.17	52.45
		SY-IN	2.52	2.58	2.65	2.71	2.78	2.85
5	Joint Resealing (JFR)	LF	2.14	2.19	2.25	2.30	2.36	2.42
6	Joint Resealing (NON - JFR)	LF	1.90	1.95	2.00	2.05	2.10	2.15
7	Crack Routing/Sealing (PCC)	LF	2.63	2.70	2.76	2.83	2.90	2.97
8	Neoprene Compression Joint Seal							
	-- Saw Cutting Only	LF	1.33	1.36	1.40	1.43	1.47	1.50
	-- Lubrication, Furnish and Install Compression Seal							
	-- 1/2-in. wide joint	LF	3.30	3.38	3.47	3.55	3.64	3.73
	-- 5/8-in. wide joint	LF	3.66	3.75	3.85	3.94	4.04	4.14
	-- 3/4-in. wide joint	LF	4.49	4.60	4.72	4.84	4.96	5.09
9	Spall Repairs (Epoxy-Bonded PCC)	SF	25.30	25.93	26.58	27.25	27.93	28.63
10	PCC Pavement Removal (To Base Course) T < 12 in.	SY-IN	1.01	1.04	1.06	1.09	1.12	1.15
11	PCC Pavement Removal (To Base Course) T > 12 in.	SY-IN	1.39	1.46	1.50	1.53	1.57	1.61
12	Asphalt Pavement Removal (to base course)	SY-IN	0.92	0.94	0.97	0.99	1.01	1.04
13	Base/Subgrade Removal	SY-IN	0.61	0.63	0.64	0.66	0.66	0.69
14	Asphalt Milling/Profiling/Grinding (Cold)							
	-- up to 1-in. depth	SY	1.56	1.60	1.64	1.68	1.72	1.77
	-- up to 2-in. depth	SY	2.26	2.32	2.37	2.43	2.49	2.55
	-- up to 3-in. depth	SY	2.38	2.44	2.50	2.56	2.62	2.69
	-- up to 4-in. depth	SY	2.50	2.56	2.63	2.69	2.76	2.83
	-- small difficult jobs (hard agg. etc.)	SY-IN	2.97	3.04	3.12	3.20	3.28	3.36
15	PC Concrete Grinding/Profiling (Normally 1/2 in. is max Feasible)	SY-IN	19.02	19.50	19.98	20.48	20.99	21.52
16	Heater-Scarification (3/4—in.) – rejuvenation	SY	1.32	1.35	1.39	1.42	1.46	1.49
17	Cold Recycling 6 in. AC with 4-in.-thick AC O/L	SY	17.46	17.90	18.34	18.80	19.27	19.75
18	Slurry Seal	SY	1.57	1.61	1.65	1.69	1.73	1.78
(Continued)								

Table 3-5 (Concluded)								
Item	Description	U/M	Unit Cost (\$)					
			FY00	FY01	FY02	FY03	FY04	FY05
19	Micro-Surfacing	SY	2.26	2.32	2.37	2.43	2.49	2.55
20	Single Bituminous Surface Treatment	SY	1.90	1.95	2.00	2.05	2.10	2.15
21	Double Bituminous Surface Treatment	SY	2.75	2.82	2.89	2.96	3.03	3.11
22	Rubberized Coal Tar Pitch Emulsion Sand Slurry Surface Treatment	SY	1.72	1.76	1.81	1.85	1.90	1.94
23	Rubberized Coal Tar Pitch Emulsion (No Aggregate)	SY	1.13	1.16	1.19	1.22	1.25	1.28
24	Fog Seal	SY	0.77	0.79	0.81	0.83	0.85	0.87
25	Rubberized Asphalt Systems							
	-- Stress Absorbing Membrane (SAM) Interlayer	SY	4.40	4.51	4.62	4.74	4.86	4.98
	-- SAM Seal Coat (uncoated chips)	SY	4.64	4.76	4.87	5.00	5.13	5.25
	-- SAM Seal Coat (precoated chips)	SY	4.99	5.11	5.24	5.37	5.50	5.64
26	Reinforcing Fabric Membranes (including tack coat)	SY	2.47	2.53	2.60	2.66	2.73	2.79
27	Elastomeric Inlay installed in Existing PCC, Complete (2 ft Wide X 100 ft Long X 2 in. Deep)	EA	25.0K	25.6K	26.3K	26.9K	27.6K	28.3K
28	PC Concrete Inlay (20 ft X 120 ft X 12 in. in Asphalt Pavement)	EA	17.8K	18.2K	18.7K	19.2K	19.7K	20.2K
29	Runway Grooving							
	-- Asphalt Concrete Pavement	SY	1.90	1.95	2.00	2.05	2.10	2.15
	-- Portland Concrete Pavement	SY	4.16	4.26	4.37	4.48	4.59	4.71
30	Runway Rubber Removal (High Pressure Water Blasting Method)	SF	0.059	0.060	0.062	0.063	0.065	0.066
31	Paint Removal							
	-- Partial Removal (Remove only loose, flaking, or poorly bonded paint)	SF	0.059	0.060	0.062	0.063	0.065	0.066
	-- Complete Removal (Using High Pressure water with sand injection)	SF	0.69	0.70	0.72	0.74	0.76	0.78
32	Airfield Marking							
	-- Reflectorized	SF	0.46	0.47	0.48	0.50	0.51	0.53
	-- Non-Reflectorized	SF	0.26	0.27	0.27	0.28	0.29	0.29
33	Street Marking							
	-- Reflectorized	SF	0.33	0.34	0.35	0.36	0.37	0.38
	-- Non-Reflectorized	SF	0.21	0.22	0.22	0.23	0.24	0.24
34	Random Slab Replacement							
	-- 12 ft by 12 ft by 12-in. thick	EA	1.2K	1.2K	1.3K	1.3K	1.3K	1.4K
	-- 25 ft by 25 ft by 12-in. thick	EA	4.8K	4.9K	5.0K	5.2K	5.3K	5.5K
	-- 25 ft by 25 ft by 18-in. thick	EA	7.1K	7.3K	7.5K	7.6K	7.8K	8.0K
	-- 25 ft by 25 ft slab	SY-IN	5.56	5.70	5.84	5.99	6.14	6.29
35	Soil Cement Stabilization (10 percent by weight)	SY-IN	0.50	0.51	0.53	0.54	0.55	0.57

4 Conclusions

The maintenance and rehabilitation alternatives discussed in Chapter 3 and summarized in Table 3-2 should be performed as soon as possible to retain the full benefit of the structural capacity of the existing pavements. The M & R alternatives suggested for the existing surfaces were selected from the alternatives listed for the various distresses shown in Tables 3-3 and 3-4. In many instances the performance of a specific alternative is dependent upon local conditions and contractors.

The operational ACN for the airfield rigid pavement facilities is 45/R/B/W/T and for the flexible pavement facilities 36/F/A/W/T/. PCNs for each facility are shown in Illustration 1. ISR ratings based on the ACN/PCN ratios and the PCIs of each respective facility are shown in Illustration 2.

PCI's for the controlling feature of each pavement facility during the thaw-weakened periods are provided in Table D4 as guidance to the airfield operator for managing airfield operations during the November through April time frame.

References

American Society of Testing and Materials. (1994). "Standard test method for airport pavement condition index surveys," Designation: D 5340-93, West Conshohocken, PA.

American Society of Testing and Materials. (1999). "Standard practice for use of metric (SI) units in building design and construction," Designation: E 621-94, West Conshohocken, PA.

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Appendix A

Background Data

Description of the Airfield

VFANG is located at Camp Douglas, Wisconsin in Juneau County and approximately 177 km (110 miles) northeast of Madison, WI. The airfield is located on the southerly side of a broad flat valley, which is bounded on the south, east, and west by steep, rocky bluffs. In the valley within the limits of the landing area the maximum difference in elevation is approximately 20 ft, but in the southeastern corner, the bluff rises to approximately 200 ft above the elevation of the runways. The elevation of the field itself is 912 ft above sea level. The soils in the area consist of sand and silty sands.

A layout of the airfield is shown in Figure A1. Pavement feature identifications and locations are shown in Figure A2. In July 2002 the airfield consisted of one active runway (9-27), a parallel taxiway (Taxiway A), various parking aprons, and connecting taxiways. Runway 9-27 was 2743 m (9000 ft) long and 46 m (150 ft) wide.

The climatological data used herein were obtained from the weather station at Volk Field/Camp Douglas, Wisconsin. The annual rainfall in the area is about 782 mm (30.8 in.), and the annual snowfall is 1067 mm (42 in.). The maximum and minimum temperatures were 41°C and -21°C (105°F and -37°F), respectively. Temperature and precipitation data are summarized in Table A1.

Previous Reports

Pertinent data for use in this evaluation were extracted from the previous reports listed below:

- a. Air National Guard Civil Engineering Technical Services Center, "Airfield Pavement Condition Report and Pavement Maintenance Plan, Volk Field ANG Base, Camp Douglas, Wisconsin," June 2000, Minot, ND.
- b. Air National Guard Bureau Civil Engineering Technical Services Center, "Airfield Pavement Condition Survey, Volk Field ANG Base, Camp Douglas, Wisconsin," December 1992, Minot, ND.

- c. U.S. Army Engineer Waterways Experiment Station, “Airfield Pavement Evaluation, Volk Field, Air National Guard, Camp Douglas, Wisconsin,” Miscellaneous Paper GL-86-22, August 1986, Vicksburg, MS.
- d. Air National Guard Support Center, “Airfield Pavement Condition Survey Report, Volk Field (ATS), Wisconsin,” July 1981, Andrews AFB, MD.
- e. Air Force Civil Engineering Center, “Airfield Pavement Evaluation and Condition Survey Report, Volk Field (ANG), Wisconsin,” June 1974, Tyndall AFB, FL.
- f. U.S. Army Engineer District, Chicago, “Analysis of Design for Runway and Taxiway Extension – Blast Pad – Warm-Up-Pad – and Overrun, Camp Williams, Wisconsin,” January 1962, Chicago, IL.
- g. U.S. Army Engineer District, Chicago, “Volk Field, Camp Douglas, Wisconsin, Air National Guard Parking Apron Rehabilitation Report of Investigations,” June 1958, Chicago, IL.

Design and Construction History

The original pavements at VFANG were constructed in 1941. Upgrading of the pavements, including new construction and reconstruction or strengthening of the existing facilities, was performed at various periods from 1949 through 1984. Design wheel loads for the pavement constructed prior to 1958 are not available. The eastern 1,000 ft of the runway, Taxiway A, and the warm-up aprons constructed in 1962 along with the southeast parking apron and Taxiway G constructed in 1964 were designed to support a single-wheel load of 25,000 lb with a tire contact area of 100 in.² Since 1993, nearly sixty-five percent of the airfield pavement has been replaced. An \$8 million ramp project was completed in 1993, the hot pit refueling facilities were added in 1998, and a \$10 million runway reconstruction was accomplished in 1999. Table A2 presents the history of the major construction activities at VFANG. A summary of the physical property data of the various pavement features is shown in Table A3.

Traffic History

The airfield operations manager provided traffic records for VFANG at the time of this evaluation for the 1-year period August 2001 through July 2002. Frequencies of operation for the various aircraft are well defined by accurate records presented in Table A4. Currently utilizing the facilities are the U.S. Air Force C-5, C-141, C-17, C-130, C-9, F-14, F-15, F-16, F-18, and KC-135, as well as contract aircraft A-10, B-717, B-737, B-757, DC-10, L1011, SW-4, ND-11, MD-80 and miscellaneous smaller aircraft. The KC-135 aircraft was selected as the design aircraft for Features A1B, A3C, A6B, A7B, A8B, A9C, A10B, A11D, A13B, A14B, R1A, R3C, R7C, R9A, T11A, T15A, T18C, T19A,

T17C, T21A, T22C, T23C, T24C, and T25A. The B-737 was selected as the design aircraft for Features A5B, A12B, R5C, T2C, T4A, T6A, T7B, T9C, T14A, and T16C.

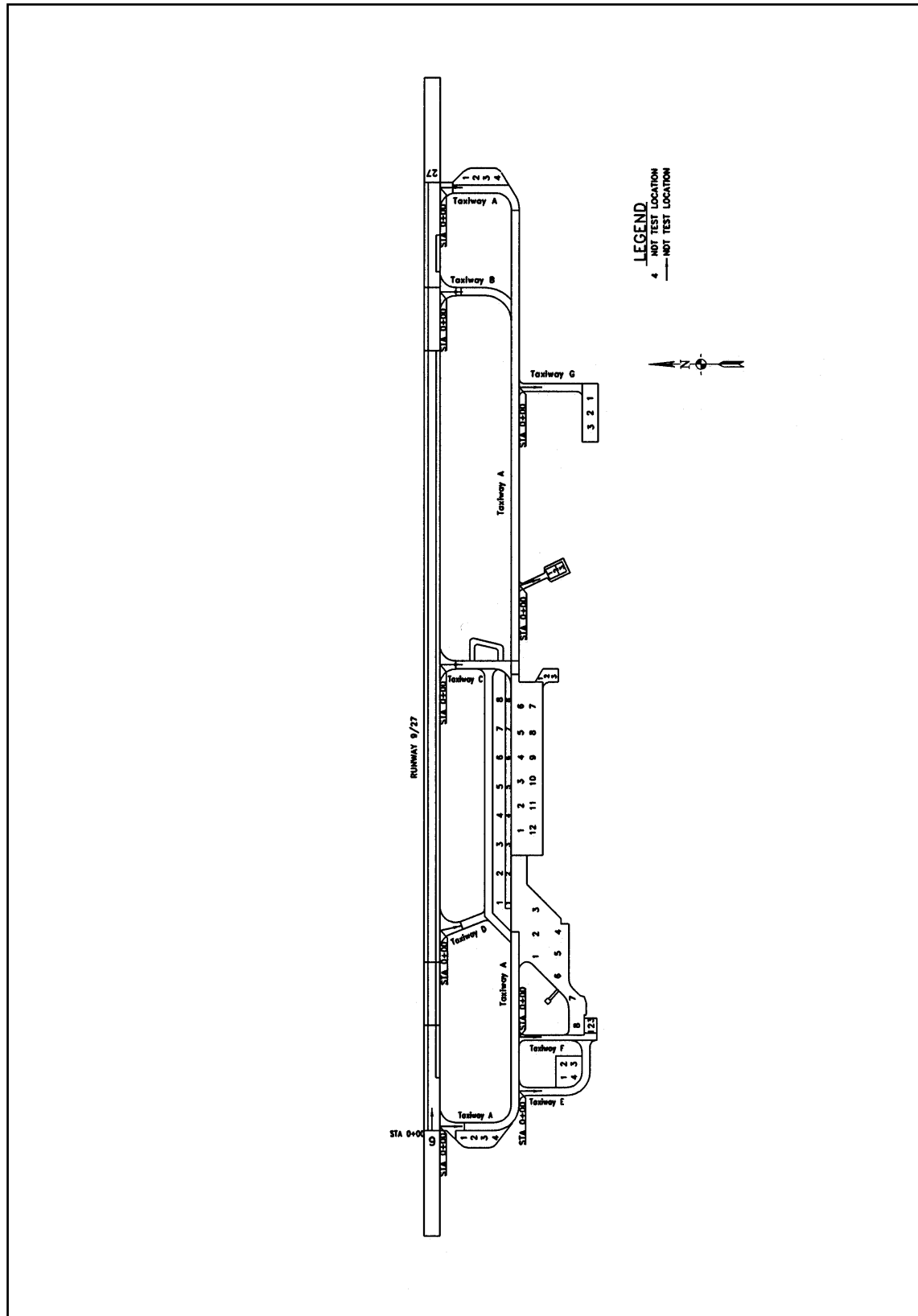


Figure A1. Layout of airfield and facility identifications

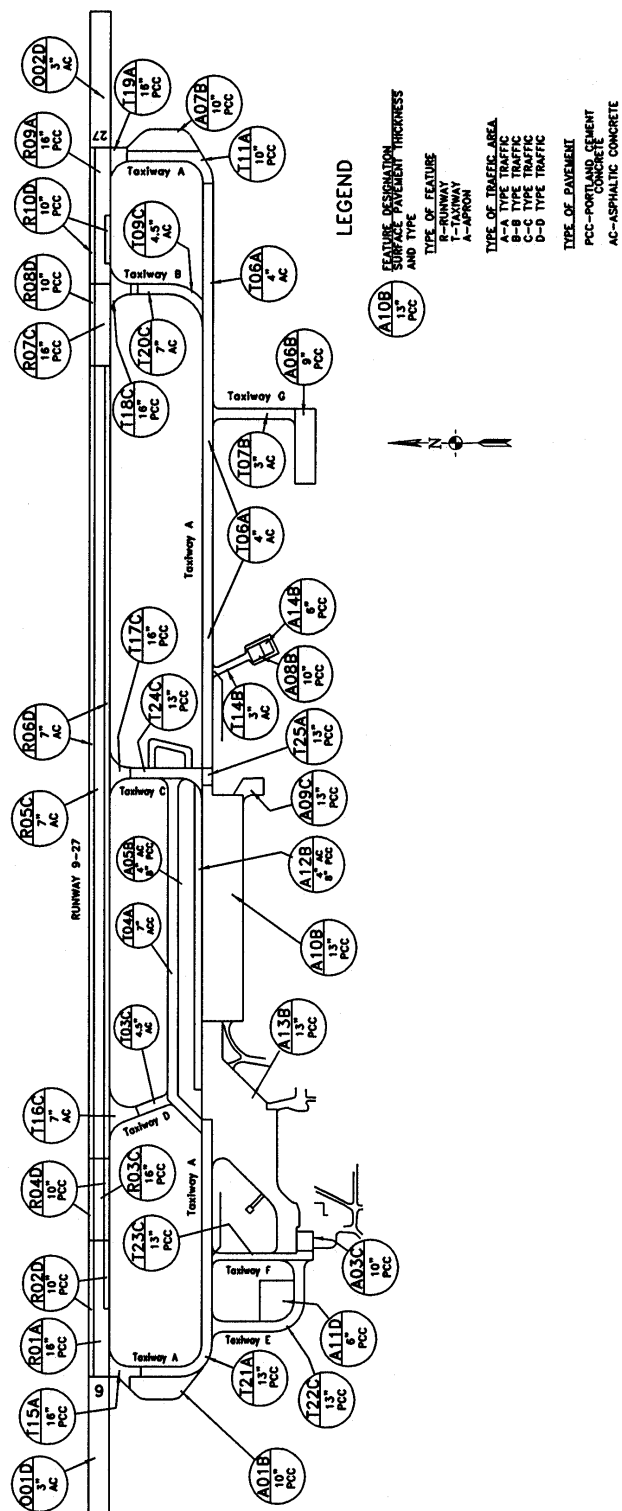


Table A1 Climatological Data Summary														
	J	F	M	A	M	J	J	A	S	O	N	D	ANN	YRS REC
Temperature, °C (°F)														
Highest	14 (57)	18 (64)	29 (84)	36 (96)	34 (94)	39 (102)	41 (105)	41 (105)	38 (100)	34 (93)	25 (77)	18 (64)	41 (105)	31
Mean Daily Max	-4 (24)	-2 (29)	5 (41)	14 (57)	21 (69)	26 (78)	28 (83)	27 (80)	22 (72)	16 (60)	7 (45)	-2 (29)	14 (57)	31
Mean	-8 (18)	-6 (22)	2 (35)	9 (49)	16 (61)	21 (70)	24 (75)	22 (72)	17 (63)	11 (52)	3 (37)	-4 (24)	9 (49)	31
Mean Daily Min	-12 (10)	-10 (14)	3 (27)	4 (40)	11 (52)	16 (61)	19 (66)	17 (63)	12 (54)	7 (44)	0 (32)	-8 (18)	5 (41)	31
Lowest	-21 (-37)	-20 (-36)	-16 (-29)	-18 (0)	-7 (19)	-1 (31)	-1 (33)	3 (35)	-5 (23)	-11 (13)	-6 (-10)	-17 (-30)	-21 (-37)	31
Precipitation, mm (in.)														
Mean	25 (1)	25 (1)	51 (2)	76 (3)	84 (3.3)	99 (3.9)	99 (3.9)	97 (3.8)	84 (3.3)	56 (2.2)	48 (1.9)	38 (1.5)	782 (30.8)	31
Snowfall, mm (in.)														
Mean	254 (10)	203 (8)	229 (9)	51 (92)	#	0	0	0	#	#	101.6 (4)	229 (9)	1067 (42)	31
Relative Humidity, %														
Mean 0600 LST 1600 LST	79 64	72 57	76 52	76 46	72 46	76 51	79 51	84 54	86 56	77 54	81 61	82 66	78 55	31
Source of data: www.afccc.af.mil/climo Volk Field/Camp Douglas, Wisconsin # Denotes less than 1 mm (0.05 in.).														

**Table A2
Construction History**

Pavement Facility (Feature)	Surface Pavement		Construction Date
	Thickness, mm (in.)	Type	
Runway 9-27			
R1A	406 (10.0)	PCC	1969
R3C	140 (5.5)	AC	1942
R10D	152 (6.0)	AC	1942
R3C, R4D, R5C, R10D	76 (3.0)	AC	1976
R9A	406 (10.0)	PCC	1962
R1A, R3C, R7C, and R9A	406 (16.0)	PCC	1999*
R2D, R6D, R7C, R8D	254 (10.0)	PCC	1956
R2D, R4D, R8D, and R10D	254 (10.0)	PCC	1999 ¹
R5C and R6C	178 (7.0)	AC	1999 ¹
Taxiway A			
T4A	76 (3.0)	AC	1959
T4A	102 (4.0)	AC	1993 ²
T6A, T25A	102 (4.0)	AC	1983
T11A	254 (10.0)	PCC	1962
T15A, T21A	254 (10.0)	PCC	1956
T19A	254 (10.0)	PCC	1962
T15A and T19A	406 (16.0)	PCC	1999 ¹
T21A and T25A	330 (13.0)	PCC	1993 ¹
Taxiway B			
T9C	(114) (4.5)	AC	1999 ¹
T18 C	254 (10.0)	PCC	1956
T18C	406 (16.0)	PCC	1999 ¹
T20C	178 (7.0)	AC	1999 ¹
Taxiway C			
T17C	406 (16.0)	PCC	1999 ¹
T17C	102 (4.0)	AC	1969
T24C	254 (10.0)	PCC	1962
T24C	330 (13.0)	PCC	1992
Taxiway D			
T3C	(114) (4.5)	AC	1969
T3C	254 (10.0)	PCC	1942
T16C	178 (7.0)	AC	1999 ²
Taxiway E			
T22C	51 (2.0)	AC	1956
T22C	102 (4.0)	AC	1969
T22C	330 (13.0)	PCC	1998 ¹
Taxiway F			
T23C	330 (13.0)	PCC	1998
Taxiway G			
T7B	76 (3.0)	AC	1964
Trim Pad Access			
T14B	76 (3.0)	AC	1984
Alert Apron			
A6B	229 (9.0)	PCC	1964
East Arm/Disarm Apron			
A7B	254 (10.0)	PCC	1969
Trim Pad			
A8B	254 (10.0)	PCC	1984
A9B	330 (13.0)	PCC	1993
A14B	254 (10.0)	PCC	1984
Parking Apron East			
A10B	330 (13.0)	PCC	1995
Hot Fuel Pad			
A11D	152 (6.0)	PCC	1998
(Continued)			
¹ Reconstruction. ² Overlay.			

Table A2 (Concluded)			
Pavement Facility (Feature)	Surface Pavement		Construction Date
	Thickness, mm (in.)	Type	
Parking Apron North A12B A12B	203 (8.0) 102 (4.0)	PCC ACC	1942 1993
Parking Apron West A13B	330 (13.0)	PCC	1993
West Arm/Disarm Apron A1B A1B	76 (3.0) 354 (10.0)	AC PCC	1963 1969
Hangar 504 Apron A3C	254 (10.0)	PCC	1967
Parking Apron North A5B A5B	203 (8.0) 102 (4.0)	PCC AC	1942 1993
Alert Apron A6B	152 (6.0)	AC	1964

Table A3 Summary of Physical Property Data																		
Feature	Facility			Overlay Pavement			Pavement			Base			Subbase			Subgrade		
	Identification	Length in (ft)	Width in (ft)	Pavement Condition Rating PCI	Thickness mm (in.)	Description	Flex. Str. ¹ MPa (psi)	Thickness mm (in.)	Description	Flex. Str. ¹ MPa (psi)	Thickness mm (in.)	Description	Modulus ² MPa (psi)	Thickness mm (in.)	Description		Modulus ² MPa (psi)	
Fixed-Wing Facilities																		
R01A	Runway 09-27	305 (1,000)	23-34 (75-112.5)	Excellent 100				406(16.0)	PCC	4.5 (650)	254 (10.0)	Crushed PCC and/or AC	447 (64,876)	102 (4.0)	Gravel (GP) NFS	215 (31,123)	Sand (SP-SM) F2	215 (31,123)
R02D	Runway 09-27 (Runway Edges)	475 (1,500)	11 (37.5)	Excellent 98				254(10.0)	PCC	4.5 (650)	406 (16.0)	Crushed PCC and/or AC	— ³	102 (4.0)	Gravel (GP) NFS	— ³	Sand (SP-SM) F2	— ³
R03C	Runway 09-27	183 (600)	23 (75)	Excellent 100				406(16.0)	PCC	4.5 (650)	254 (10.0)	Crushed PCC and/or AC	405 (58,715)	102 (4.0)	Gravel (GP) NFS	181 (26,130)	Sand (SP-SM) F2	181 (26,180)
R04D	Runway 09-27 (Runway Edges)	366 (1,200)	11 (37.5)	Excellent 99				254(10.0)	PCC	4.5 (650)	406 (16.0)	Crushed PCC and/or AC	— ³	102 (4.0)	Gravel (GP) NFS	— ³	Sand (SP-SM) F2	— ³
R05C	Runway 09-27	1788 (5,800)	23 (75)	Excellent 100				178(7.0)	AC		203 (14.0)	Crushed PCC and/or AC	970 (140,686)	229 (9.0)	Gravel (GP) NFS	188 (27,235)	Sand (SP-SM) F@	188 (27,235)
R06D	Runway 09-27 (Runway Edges)	3536 (11,600)	11 (37.5)	Excellent 99				178(7.0)	AC		356 (14.0)	Crushed PCC and/or AC	— ³	229 (9.0)	Gravel (GP) NFS	— ³	Sand (SP-SM) F@	— ³
R07C	Runway 09-27	183 (600)	34 (112.5)	Excellent 100				406(16.0)	PCC	4.5 (650)	356 (10.0)	Crushed PCC and/or AC	438 (63,528)	102 (4.0)	Gravel (GP) NFS	207 (29,589)	Sand (SP-SM) F2	207 (29,989)
R08D	Runway 09-27 (Runway Edges)	183 (600)	11 (37.5)	Excellent 99				254(10.0)	PCC	4.5 (650)	406 (16.0)	Crushed PCC and/or AC	— ³	102 (4.0)	Gravel (GP) NFS	— ³	Sand (SP-SM) F2	— ³
R09A	Runway 09-27	305 (1,000)	34 (112.5)	Excellent 99				406(16.0)	PCC	4.5 (650)	254 (10.0)	Crushed PCC and/or AC	444 (64,359)	102 (4.0)	Gravel (GP) NFS	212 (30,684)	Sand (SP-SM) F2	212 (30,684)
R10D	Runway 09-27 (Runway Edges)	411 (1,350)	11 (37.5)	Excellent 99				254(10.0)	PCC	4.5 (650)	406 (16.0)	Crushed PCC and/or AC	— ³	102 (4.0)	Gravel (GP) NFS	— ³	Sand (SP-SM) F2	— ³
(Sheet 1 of 4)																		

1¹ Values from original construction data and/or measurements recorded in previous investigations.

2² Modulus values used for the structural analysis of the pavement features.

3³ Structural analysis was not performed on runway edges.

¹ Values from original construction data and/or measurements recorded in previous investigations.² Modulus values used for the structural analysis of the pavement features.³ Structural analysis was not performed on runway edges.

Table A3 (Continued)

Facility										Overlay Pavement				Pavement				Base				Subbase				Subgrade		
ID	e a t u r e	Identification	Length m (ft)	Width m (ft)	Pavement Condition Rating PCI	Thickness mm (in.)		Flex. Str. ¹ MPa (psi)		Description		Thickness mm (in.)		Description		Modulus ² MPa (psi)		Thickness mm (in.)		Description		Modulus ² MPa (psi)		Description		Modulus ² MPa (psi)		
Fixed-Wing Facilities (Continued)																												
T15A		Taxiway A	69 (227)	23 (75)	Excellent 100							406 (16.0)	PCC			254 (10.0)	Crushed PCC and/or AC	367 (53,232)	152 (6.0)	Gravel (GP) NFS	204 (29,530)		154 (22,278)	Sand (SP-SC) F2				
T21A		Taxiway A	693 (2,275)	23 (75)	Excellent 87							330 (13.0)	PCC			102 (4.0) 152 (6.0)	Recycled AC Cr. Aggr.	393 (57,053)	432 (17.0)	Sand (SP) NFS	172 (24,960)		172 (24,960)	Sand (SP-SC) F2				
T04A		Taxiway A	799 (2,620)	23 (75)	Good 63							89 (3.5)	AC			178 (7.0) 76 (3.0)	Aggregate Base AC	352 (51,003)	432 (17.0)	Sand (SP) NFS	187 (27,185)		187 (27,185)	Sand (SP-SC) F2				
T25A		Taxiway A	38 (125)	23 (75)	Excellent 97							330 (13.0)	PCC			102 (4.0)	Recycled AC	562 (81,508)	152 (6.0)	Crushed Aggregate NFS	562 (81,380)		3358 (46,540)	Sand (SP-SC) F2				
T06A		Taxiway A	1308 (4291)	23 (75)	Fair 47							102 (4.0)	AC			102 (8.0)	AC	256 (37,126)	102 (4.0)	Crushed Aggregate (GW) NFS	256 (37,126)		256 (37,126)	Sand (SP-SC) F2				
T11A		Taxiway A	219 (720)	23 (75)	Very Good 83							254 (10.0)	PCC			152 (6.0)	Crushed (GP) NFS	301 (43,619)	102 (4.0)	Sand (SP) NFS	140 (20,521)		140 (20,321)	Sand (SP-SC) F2				
T19A		Taxiway A	37 (120)	30 (100)	Excellent 100							406 (16.0)	PCC			254 (10.0)	Crushed PCC and/or AC	445 (64,542)	152 (6.0)	Gravel (GP) NFS	213 (30,838)		213 (30,838)	Sand (SP-SC) F2				
T09C		Taxiway B	155 (507)	23 (75)	Excellent 100							279 (4.5)	AC			152 (6.0)	Gravel (GP) NFS	564 (82,539)	305 (12.0)	Sand (SP) NFS	236 (34,180)		236 (34,180)	Sand (SP-SC) F2				
T18C		Taxiway B	61 (200)	23 (75)	Excellent 100							406 (16.0)	PCC			254 (10.0)	Crushed PCC and/or AC	493 (71,486)	152 (6.0)	Gravel (GP) NFS	256 (37,193)		256 (37,193)	Sand (SP-SC) F2				
T20C		Taxiway B	9 (30)	23 (75)	Excellent 100							178 (7.0)	AC			152 (6.0)	Gravel (GP) NFS	589 (100,000)	305 (12.0)	Sand (SP) NFS	856 (124,147)		856 (124,147)	Sand (SP-SC) F2				
T17C		Taxiway C	114 (375)	23 (75)	Excellent 100							330 (13.0)	PCC			254 (10.0)	Crushed PCC and/or AC	501 (87,216)	152 (6.0)	Gravel (GP) NFS	391 (56,765)		391 (56,765)	Sand (SP-SC) F2				
Fixed-Wing Facilities (Continued)																												
Sheet 2 of 4																												

¹ Values from original construction data and/or measurements recorded in previous investigations.
² Modulus values used for the structural analysis of the pavement features.
³ Structural analysis was not performed on runway edges.

(Sheet 2 of 4)

Table A3 (Continued)

Facility				Overlay Pavement			Pavement			Base			Subbase			Subgrade			
Feature Identification	Length m (ft)	Width m (ft)	General Condition PCI	Thickness mm (in.)	Flex. Str. ¹ MPa (psi)	Thickness ¹ mm (in.)	Description	Flex. Str. ¹ MPa (psi)	Thickness mm (in.)	Description	Modulus ² MPa (psi)	Thickness ¹ mm (in.)	Description	Modulus ² MPa (psi)	Description	Modulus ² MPa (psi)			
Fixed-Wing Facilities (Continued)																			
T24C	Taxiway C	91 (304)	23 (75)	Excellent 94					330 (13.0)	PCC		152 (4.0)	Recycled AC	480 (69,687)	152 (6.0)	Crushed Aggregate S	480 (69,687)	Sand (SP-SM) F2	244 (35,449)
T03C	Taxiway D	73 (240)	23 (75)	Fair 53					114 (4.5)	AC		102 (4.0)	Crushed Aggregate (GP)	207 (30,000)	254 (10.0)	PCC	207 (30,000)	Sand (SP-SM) F2	276 (39,986)
T16C	Taxiway D	78 (255)	23 (75)	Excellent 100					178 (7.0)	AC		102 (4.0)	Crushed Aggregate (GP)	401 (58,162)	254 (10.0)	PCC	401 (58,162)	Sand (SP-SM) F2	134 (19,435)
T22C	Taxiway E	311 (1,020)	23 (75)	Excellent 99					330 (13.0)	PCC		102 (4.0)	Bituminous Base	362 (52,510)	152 (6.0)	Crushed Aggregate	362 (52,510)	Sand (SP-SM) F2	150 (21,793)
T23C	Taxiway F	226 (740)	15 (50)	Excellent 91					330 (13.0)	PCC		102 (4.0)	Bituminous Base	300 (43,582)	152 (6.0)	Crushed Aggregate	300 (43,582)	Sand (SP-SM) F2	112 (16,294)
T07B	Taxiway G	182 (600)	23 (75)	Poor 38					76 (3.0)	AC		152 (6.0)	Clayey Gravelly Sand (SC)	366 (53,092)				Sand (SP-SM) F2	189 (27,474)
T14B	Trim Pad Access	88 (290)	15 (50)	Poor 34					76 (3.0)	AC		152 (6.0)	Gravel (GP-GM)	448 (64,962)				Sand (SP-SM) F2	264 (38,281)
A01B	West Arm/Disarm Apron	133 (435)	50 (163)	Excellent 93					254 (10.0)	PCC		152 (6.0)	Gravel (GP) NFS	215 (31,106)	102 (4.0)	Sand (SP) NFS	80 (12,430)	Sand (SP-SM) F2	86 (12,480)
A03B	Hangar 504 Apron	42 (140)	37 (120)	Excellent 89					254 (10.0)	PCC		152 (6.0)	Gravel (GP) NFS	192 (27,843)	508 (20.0)	Sand (SP) NFS	74 (10,703)	Sand (SP-SM) F2	74 (10,703)
A05B	Parking Apron North	762 (2,500)	38 (125)	Good 67	102 (4.0) 76 (3.0) 102 (4.0)	AC AC Agg. Base			203 (8.0)	PCC		4.5 (650)		1857 (269,389)				Sand (SP-SM) F2	135 (19,527)
A06B	Alert Apron	168 (550)	46 (150)	Excellent 87					229 (9.0)	PCC		4.5 (650)		398 (57,740)				Sand (SP-SM) F2	217 (31,434)
(Sheet 3 of 4)																			

1 Values from original construction data and/or measurements recorded in previous investigations.
Modulus values used for the structural analysis of the pavement features.

¹ Values from original construction data and/or measurements recorded in previous investigations.² Modulus values used for the structural analysis of the pavement features.

Table A3 (Concluded)

Facility				Overlay Pavement		Pavement			Base			Subbase			Subgrade		
Identification	Length m (ft)	Width m (ft)	General Condition PCI	Thickness mm (in.)	Flex. Str. ¹ MPa (psi)	Thickness ¹ mm (in.)	Description	Flex. Str. ¹ MPa (psi)	Thickness ¹ mm (in.)	Description	Modulus ² MPa (psi)	Thickness ¹ mm (in.)	Description	Modulus ² MPa (psi)	Description	Modulus ² MPa (psi)	
Fixed-Wing Facilities (Continued)																	
A07B	East Amidsism Apron	45 (540)	49 (162)	Excellent 91					254 (10.0)	PCC	5.2 (750)	152 (6.0)	Gravel (GP) NFS	293 (42,527)	102 (4.0)	Filler (SP) NFS	135 (19,568)
A08B	Trim Pad	30 (100)	30 (100)	Good 61					254(10.0)	PCC	4.5 (650)	152 (6.0)	Gravel (GP) NFS	447 (64,911)	102 (4.0)	Filler (SP) NFS	263 (38,228)
A14B	Trim Pad	23 (75)	30 (100)	Poor 35					152 (6.0)	PCC	4.5 (650)	152 (6.0)	Gravel (GP) NFS	260 (37,698)	102 (4.0)	Filler (SP) NFS	113 (16,400)
A09C	Hanger 932 Apron	37 (120)	37 (120)	Excellent 97					330(13.0)	PCC	4.5 (650)	305 (12.0)	Recycled base NFS	296 (42,880)	229 (9.0)	Crack and sealed PCC NFS	296 (42,880)
A10B	Parking Apron East	526 (1,725)	91 (300)	Excellent 95					330(13.0)	PCC	4.5 (650)	305 (12.0)	Recycled base NFS	106 (15,371)	229 (9.0)	Crack and sealed PCC NFS	106 (15,371)
A11D	Hot Fuel Pad	99 (325)	76 (250)	Very Good 76					152 (6.0)	PCC		152 (6.0)	Aggregate (GP) NFS	151 (21,848)			53 (7,708)
A12B	Parking Apron North	683 (2,240)	15 (50)	Good 67	102 (4.0) 76 (3.0) 102 (4.0)	AC AC Agg. Base	4.5 (650)		203(6.0)	PCC				750 (108,559)			174 (25,215)
A13B	Parking Apron West	518 (1,700)	167 (550)	Excellent 92					330 (13.0)	PCC	4.5 (650)	102 (4.0)	Bluminous base NFS	259 (37,578)	152 (6.0)	Crushed Aggregate Base NFS	259 (37,578)
Sheet 4 of 4																	
1. Values from original construction data and/or measurements recorded in previous investigations. 2. Modulus values used for the structural analysis of the pavement features.																	

¹ Values from original construction data and/or measurements recorded in previous investigations.

² Modulus values used for the structural analysis of the pavement features.

Table A4
Traffic Data (August 2001 thru July 2002)

Aircraft	Weight kg (lb)	12-month Period	20-Year Departures
A-10	2,990 (66,000)	45	900
BO-28	2,000 (4,400)	1	20
C-12	7,530 (16,600)	5	100
C-130	70,310 (155,000)	286	5720
C-141	146,510 (323,000)	55	1100
C-17	263,080 (580,000)	1	20
C-21	7,530 (16,600)	2	40
C-26	7,530 (16,600)	7	140
C-5	348,810 (769,000)	7	140
C-9	48,990 (108,000)	1	20
Cessna	7,530 (16,600)	43	860
DC-10	265,805 (583,000)	4	80
E-2	23,540 (51,980)	1	20
F-14	32,930 (72,600)	1	20
F-15	30,840 (68,000)	20	400
F-16	17,000 (37,500)	585	11,700
F-18	29,940 (66,000)	150	3000
KC-135	13,680 (301,600)	182	3640
L1011	225,900 (498,000)	5	100
MD-11	26,585 (583,000)	2	40
SW-4	26,585 (583,000)	8	160
T-2	6,685 (14,737)	1	20
T-37	2,990 (6600)	4	80
T-38	5,443 (12,000)	4	80
717	54,885 (121,000)	1	20
737	68,040 (150,000)	15	300
757	116,120 (256,000)	2	40

Appendix B

Tests and Results

Tests Conducted

The pavements were evaluated based on the results from nondestructive testing utilizing a heavy weight deflectometer (HWD). The test procedures and results are discussed below.

Nondestructive Tests

Test equipment

Nondestructive tests (NDT) were performed on the pavements with the Dynatest model 8081 (HWD). The HWD is an impact load device that applies a single-impulse transient load of approximately 25- to 30-millisecond duration. With this trailer-mounted device, a dynamic force is applied to the pavement surface by dropping a weight onto a set of rubber cushions which results in an impulse loading on an underlying circular plate 300 mm (11.8 in.) in diameter in contact with the pavement. The applied force and the pavement deflections, respectively, are measured with load cells and velocity transducers. The drop height of the weights can be varied from 0 to 399 mm (15.7 in.) to produce a force from 0 to approximately 222 kN (50,000 lb). The system is controlled with a laptop computer that also records the output data. Velocities were measured and deflections computed at the center of the load plate (D1) and at distances of 305 (12), 610 (24), 914 (36), 1219 (48), 1524 (60), and 1828 mm (72 in.) (D2 - D7) from the center of the load plate.

Test procedure

On runways and taxiways, deflection basin measurements were made at 30-m (100-ft) intervals on alternate sides of the centerline along the main gear wheel paths. The tests were performed on 3- to 4-m (10- to 12-ft) offsets alternating left and right of the centerline. The parking aprons were tested in a grid pattern of approximately 30-m (100-ft) intervals or at locations that were selected to ensure that adequate NDT were performed per feature for evaluation

purposes. Lines along which the NDT were conducted are indicated in Figure B1. At each test location, pavement deflection measurements were recorded at force levels of approximately 67, 122, 157, or 222 kN (15,000, 25,000, 35,000, or 50,000 lb). Impulse stiffness modulus (ISM) values were then calculated based on the slope of the plot of impulse load versus deflection at the first sensor (D1), for the maximum force level.

NDT Analysis

The NDT results or ISM data for each facility were grouped according to different pavement features. Figures B2 through B21 graphically show the ISM test results. A representative basin for each feature was determined using the computerized Layered Elastic Evaluation Program (LEEP). Table B1 shows the representative basins for each feature as determined from the NDT.

Representative basins were used to determine section modulus values of the various layers within the pavement structure in each feature. Deflection basins were input to a multi-layered, linear elastic backcalculation program to determine the surface, base, and subgrade modulus values. The program determines a set of modulus values that provide the best fit between a measured (NDT) deflection basin and a computed (theoretical) deflection basin. Table B2 presents a summary of the backcalculated modulus values based on the representative basins for each pavement section.

Modulus values for AC surface layers can be determined using three methods: (a) use the surface temperature at the time of testing and the previous 5-day mean air temperature, (b) backcalculate the modulus values using the HWD deflection basins, or (c) determine the design modulus from past temperature data. All three methods of determining the AC modulus values are described in UFC 3-260-03 (Headquarters, Departments of the Army, the Air Force, and the Navy April 2001). All pavements have been evaluated for a design life of 20 years. The modulus of an AC layer is temperature dependent; therefore, seasonal variation is considered by using a design modulus based on historical temperature data. From the climatological table (Table A1), an average daily maximum temperature of 28°C (83°F) and an average daily mean of 24°C (75°F) for July (hottest month) were used in determining the design AC modulus. For a loading frequency of 2 Hz for taxiways and aprons, the design AC modulus is 950 MPa (137,946 psi) for a loading frequency of 10 Hz for the runway, the design AC modulus is 1656 MPa (240,353 psi). The design AC modulus along with the backcalculated values for the base and subgrade layers were used to determine the structural capacity of the AC pavement features.

Modulus values for PCC pavements can be backcalculated using the HWD deflection basins or a design modulus for the PCC can be used. In the evaluation of a rigid pavement, the design modulus should be used for the PCC layer along with the backcalculated values for the subgrade layers. The backcalculated PCC modulus values shown in Table B2 are greater than the default range of 17 237 to 68 900 MPa (2,500,000 to 10,000,000 psi) recommended in UFC 3-260-03 (Headquarters, Departments of the Army, Navy, and the Air Force, and the Navy

2001). This manual also recommends a modulus of 34 474 MPa (5,000,000 psi) for a PCC layer in good condition.

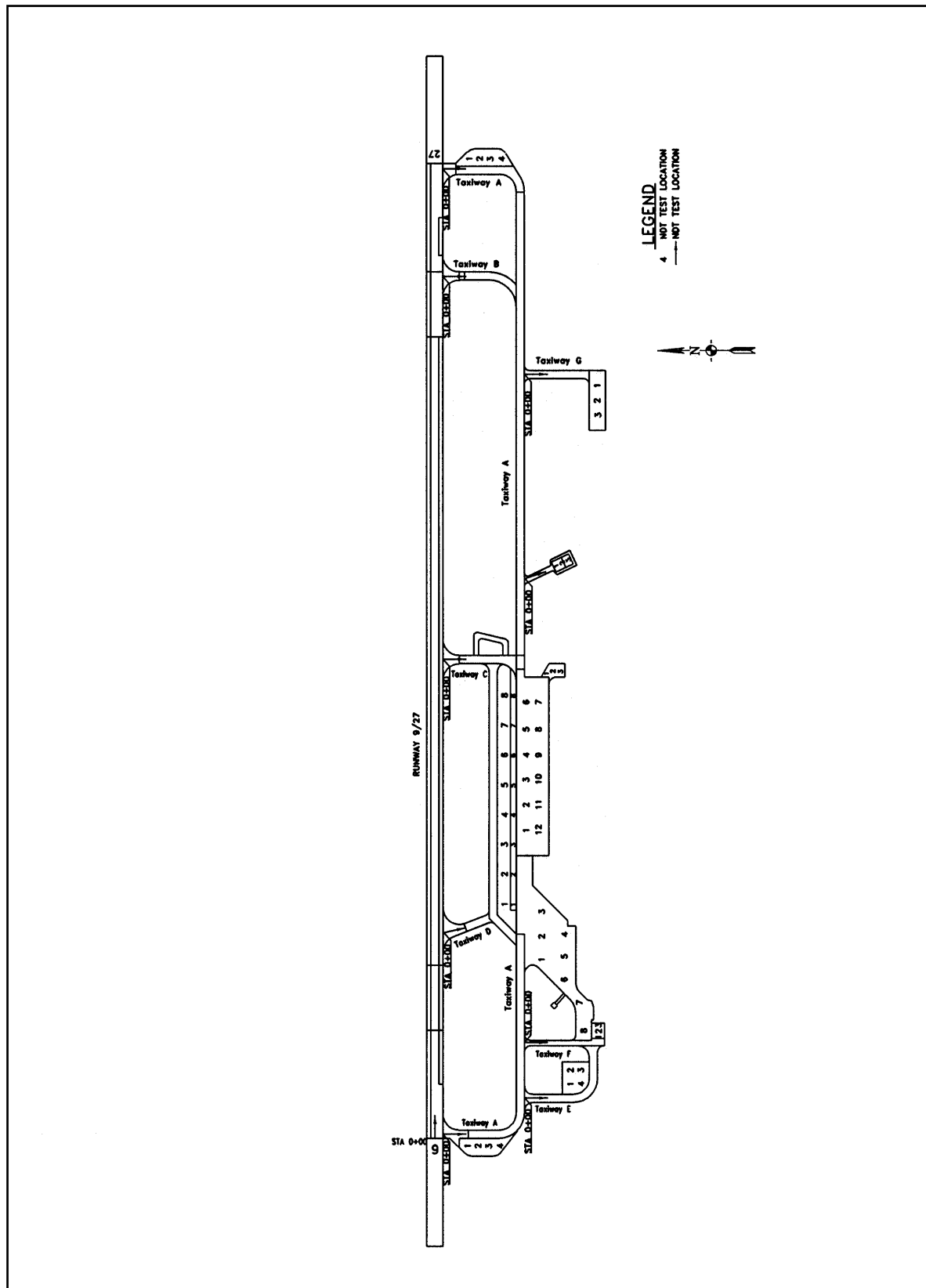


Figure B1. NDT test locations/direction

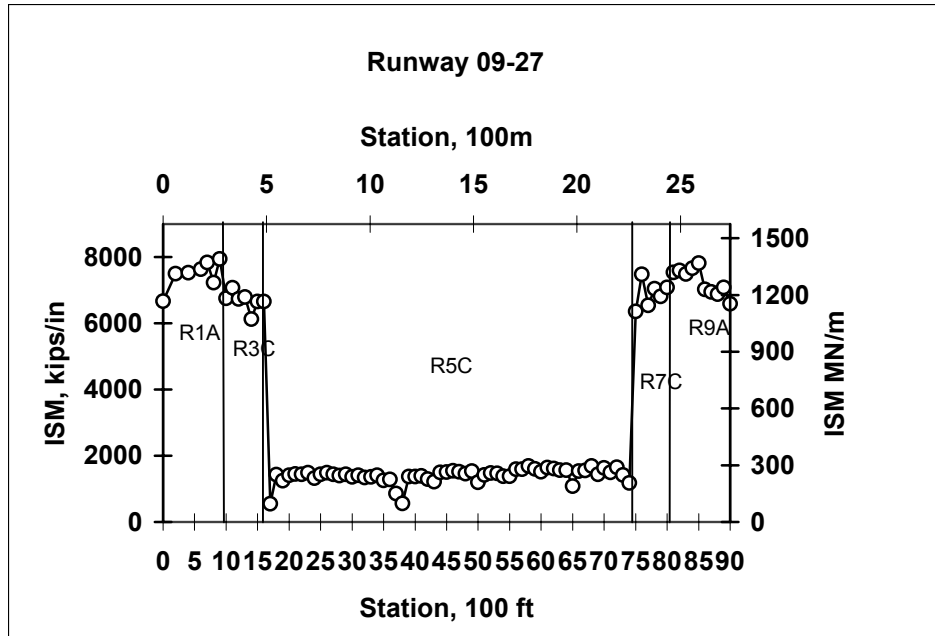


Figure B2. ISM profile, Runway 9-27, Features R1A thru R9A

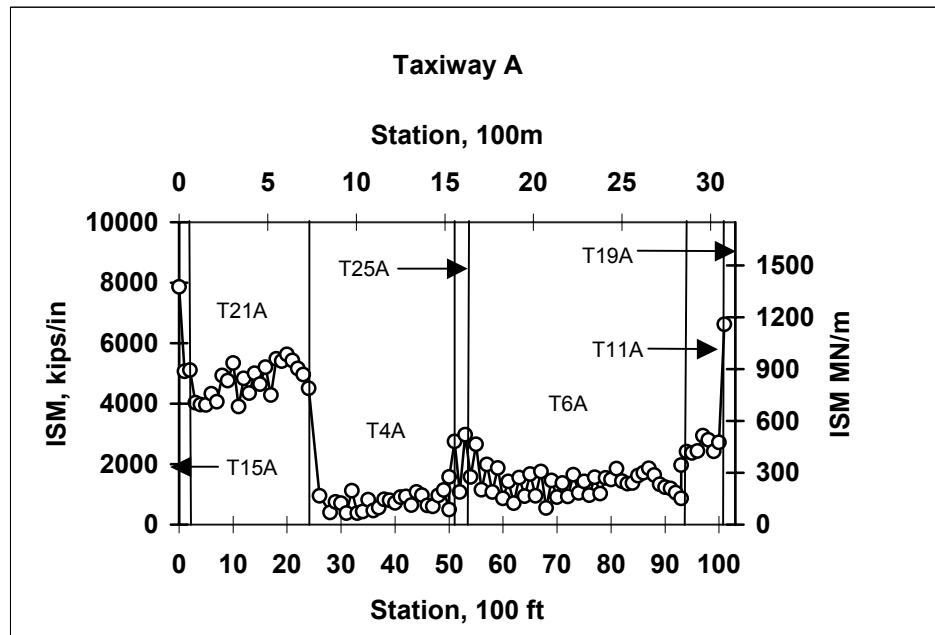


Figure B3. ISM profile, Taxiway A, Features T4A thru T25A

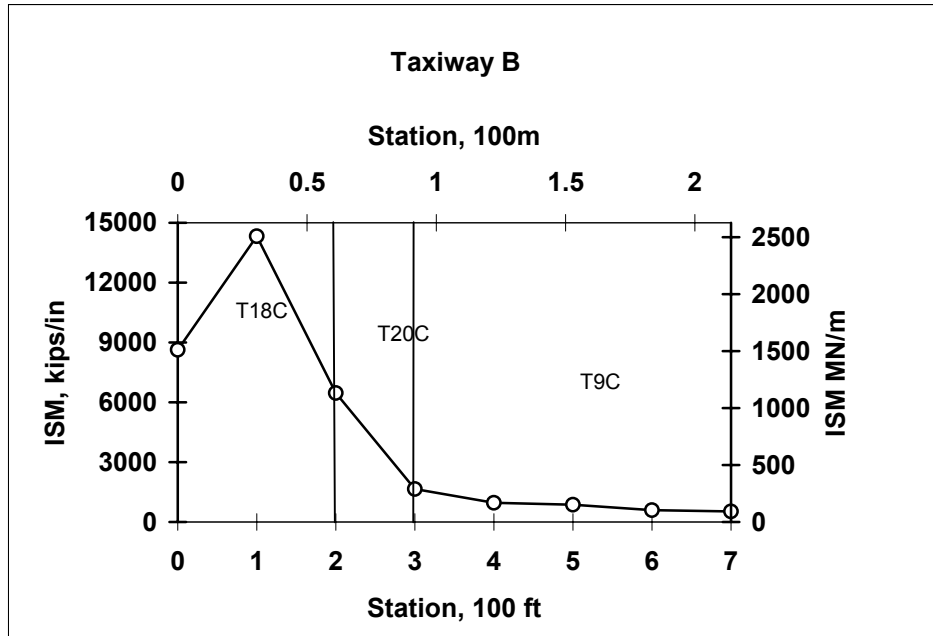


Figure B4. ISM profile, Taxiway B, Features T9C, T18C, and T20C

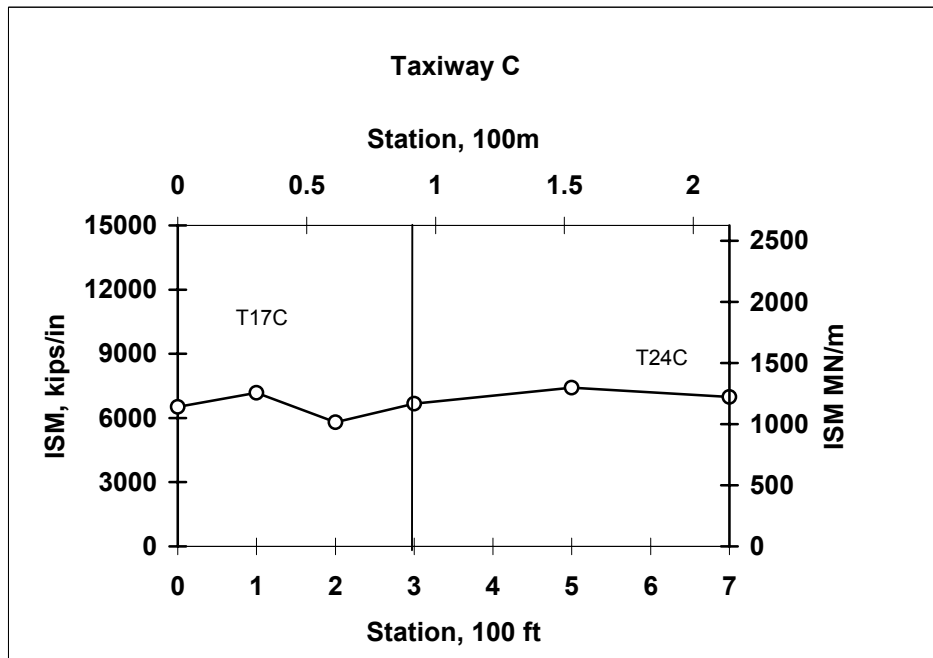


Figure B5. ISM profile, Taxiway C, Features T17C and T24C

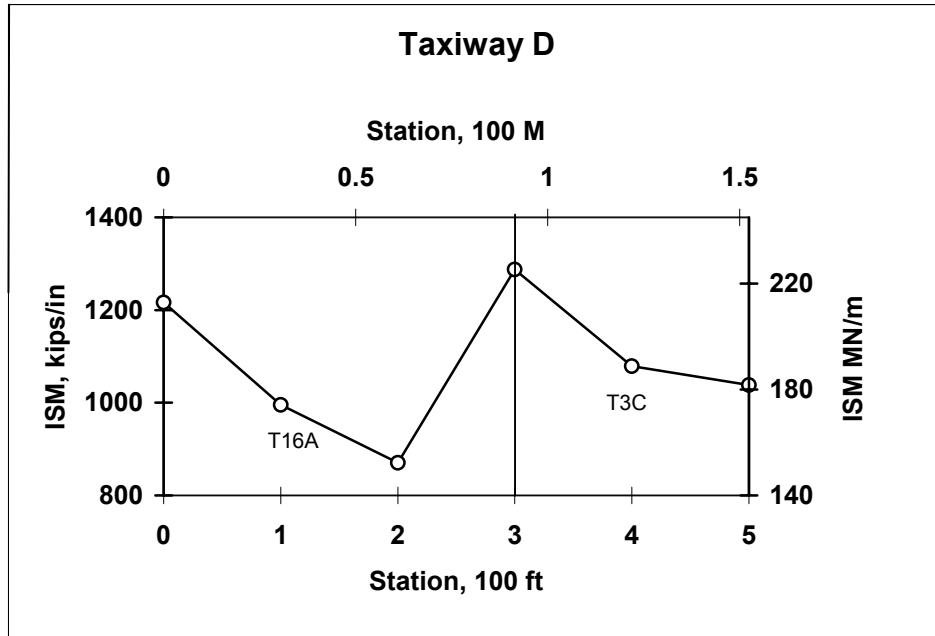


Figure B6. ISM profile, Taxiway D, Features T3C and T16A

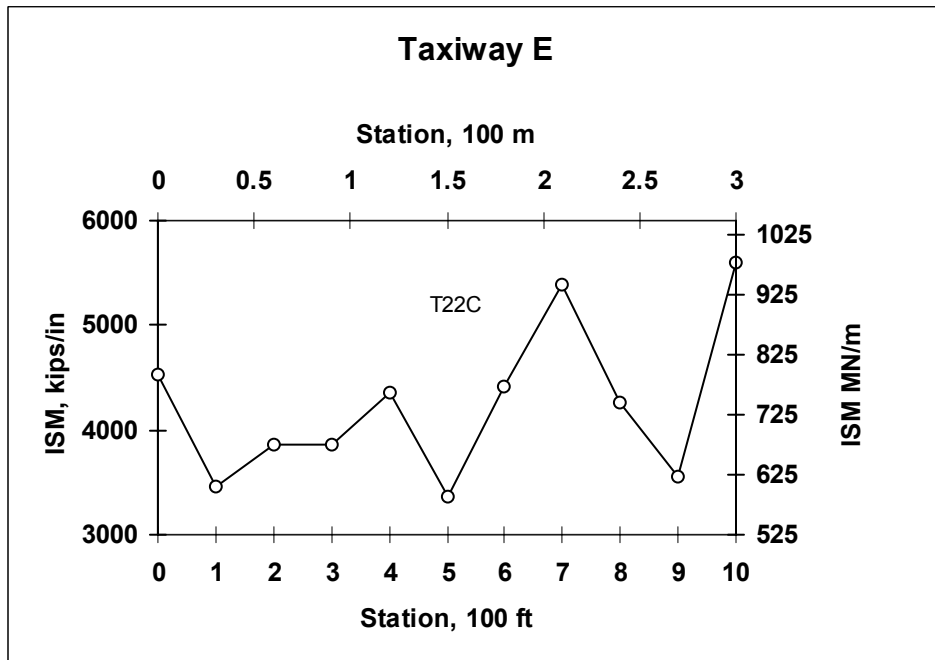


Figure B7. ISM profile, Taxiway E, Feature T22C

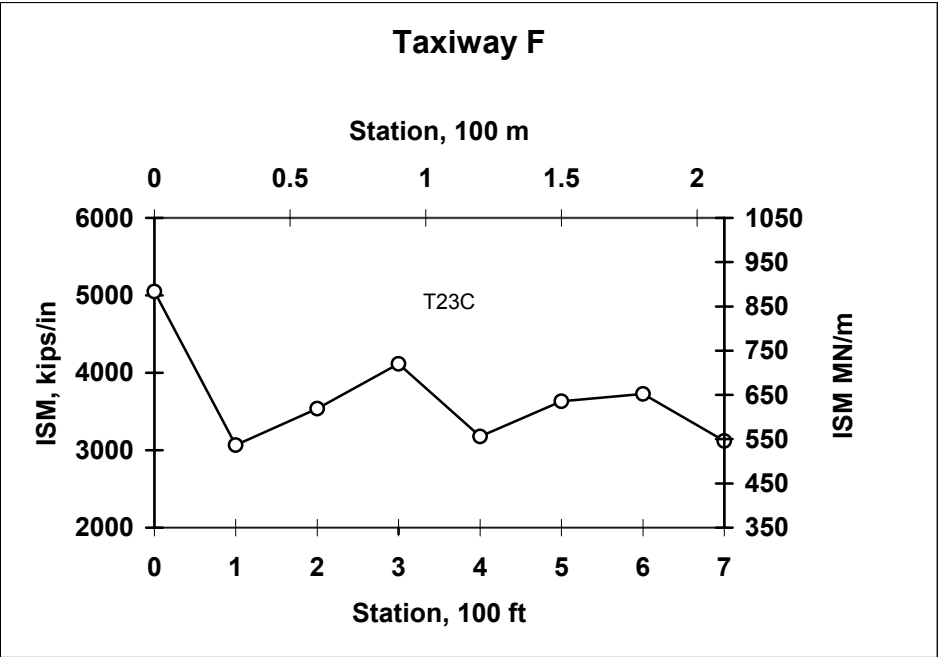


Figure B8. ISM profile, Taxiway F, Feature T23C

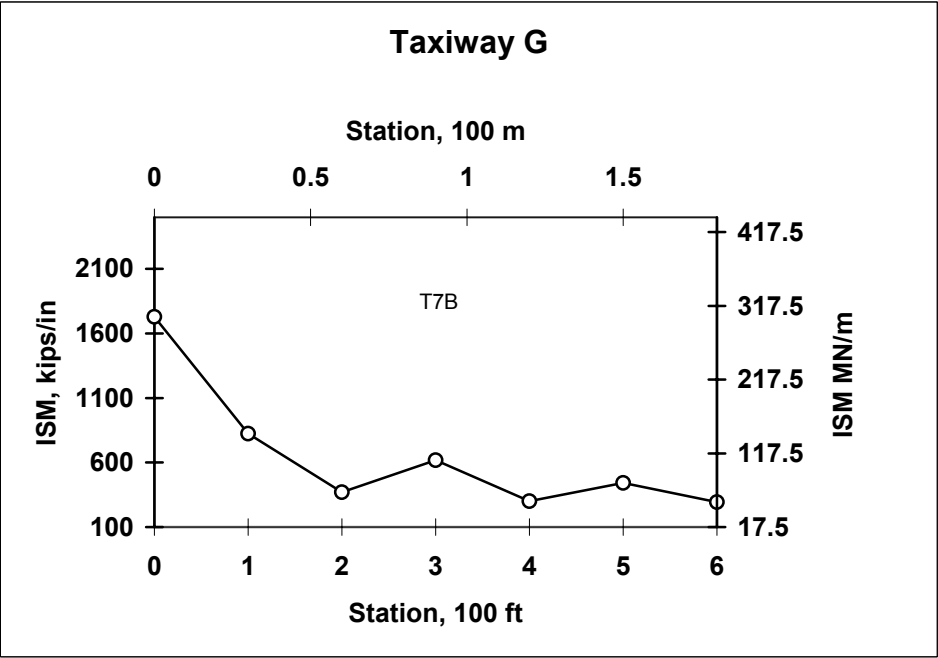


Figure B9. ISM profile, Taxiway G, Feature T7B

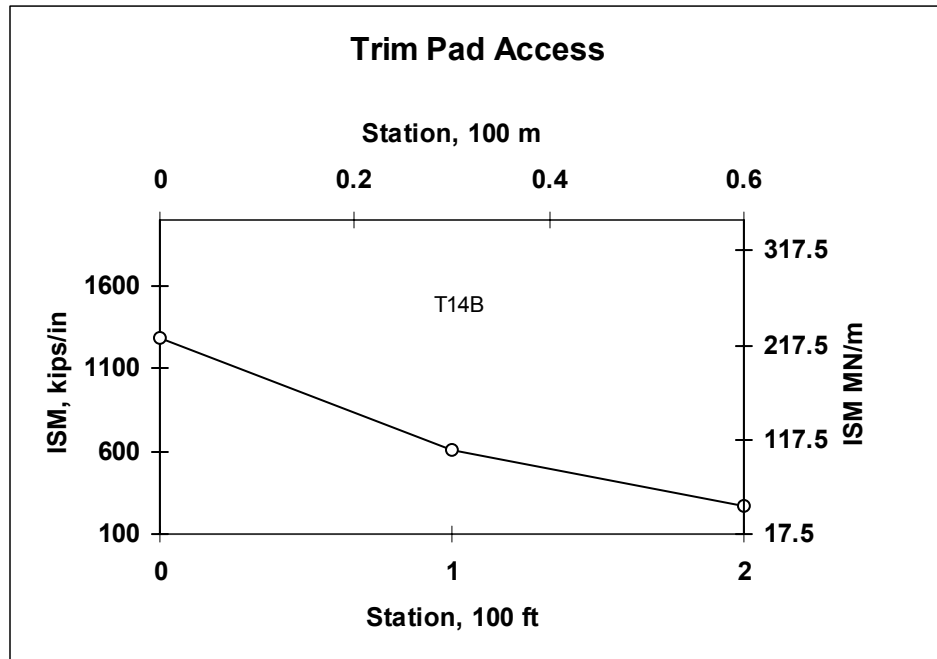


Figure B10. ISM profile, Trim Pad Access, Feature T14B

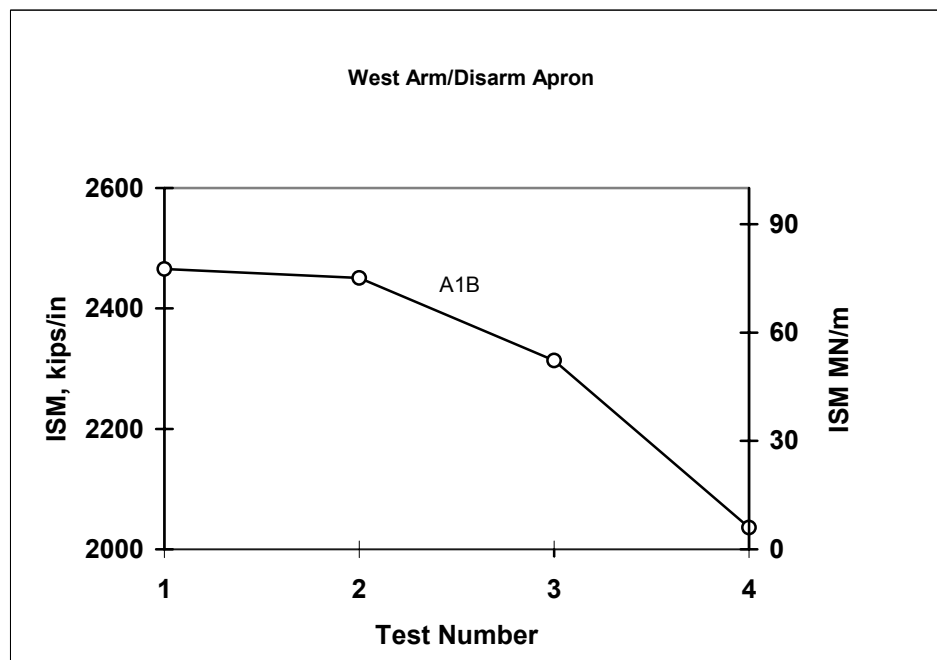


Figure B11. ISM profile, West Arm/Disarm Apron, Feature A1B

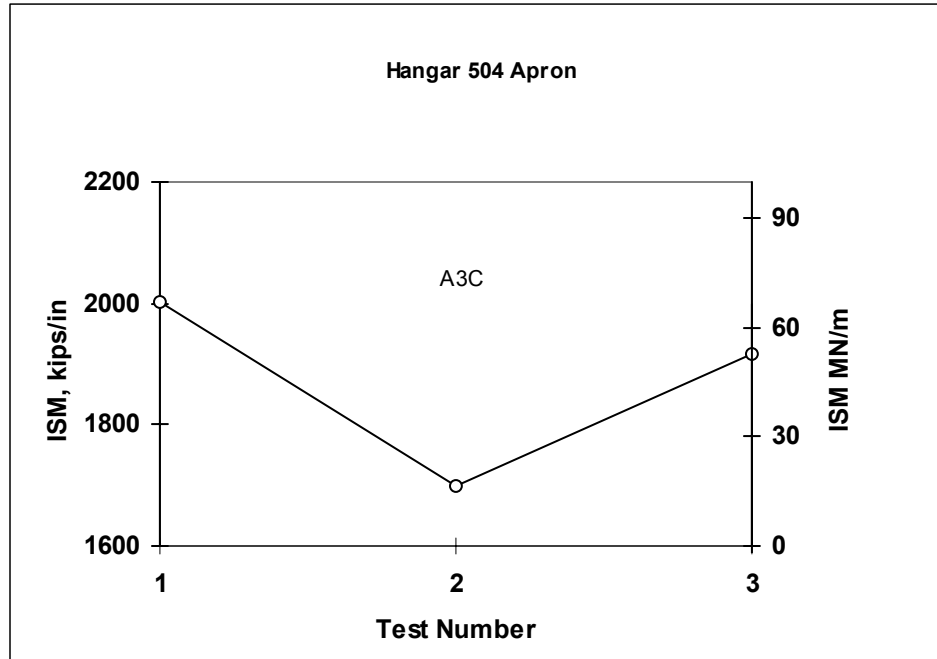


Figure B12. ISM profile, Hangar 504 Apron, Feature A3C

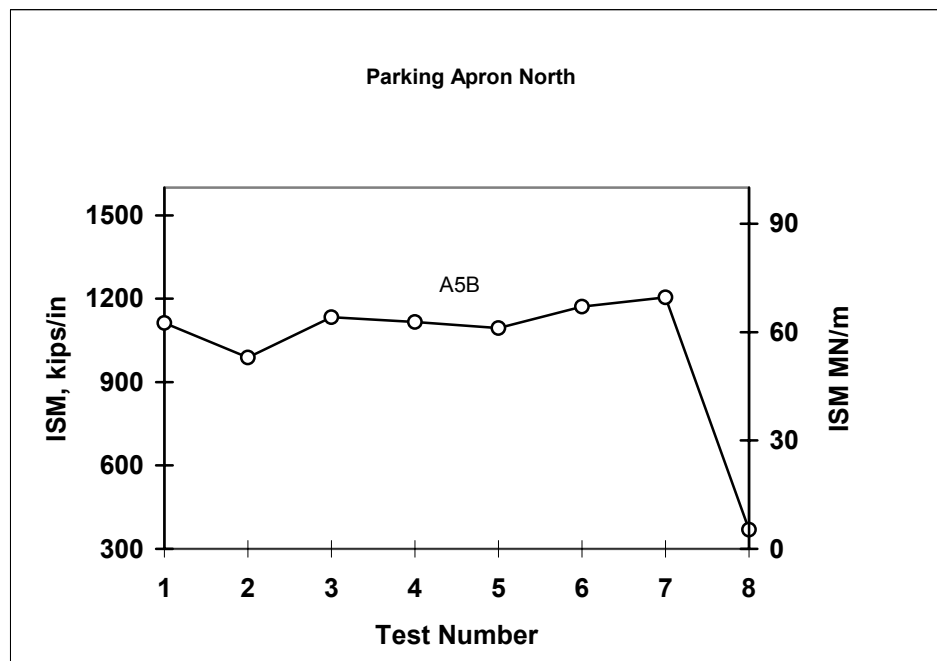


Figure B13. ISM profile, Parking Apron North, Feature A5B

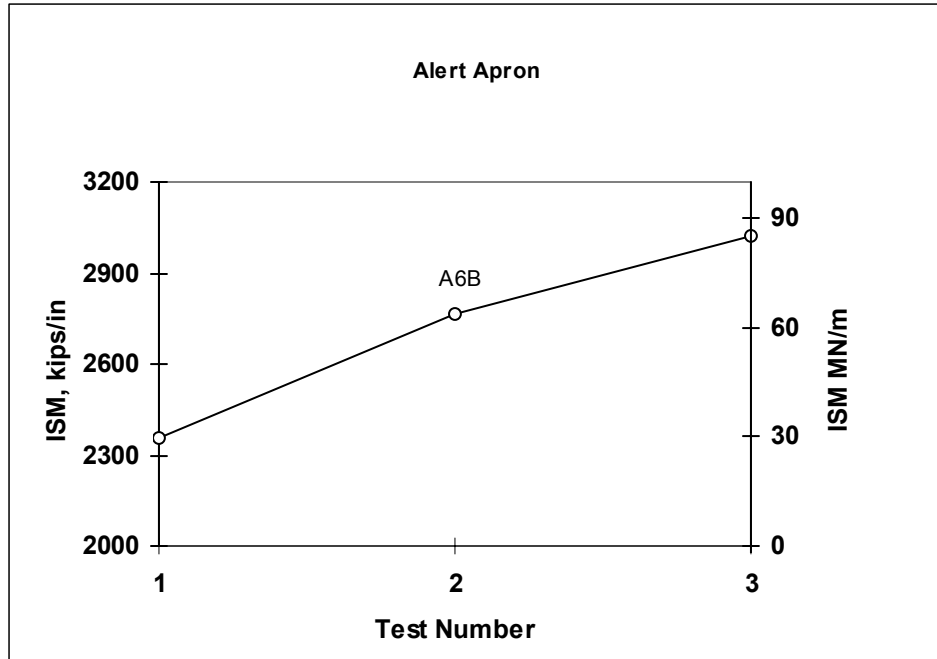


Figure B14. ISM profile, Alert Apron, Feature A6B

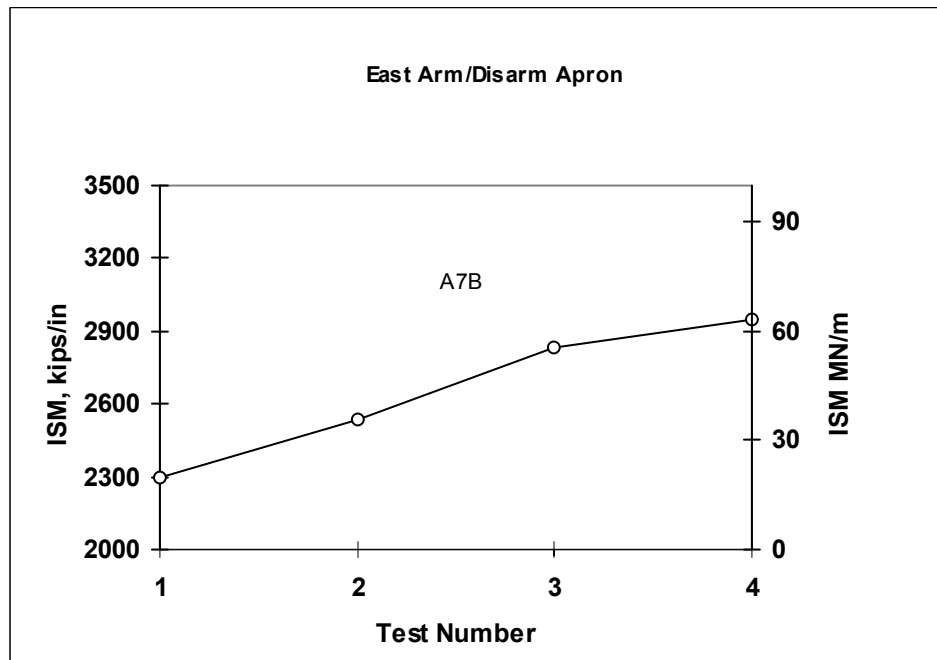


Figure B15. ISM profile, East Arm/Disarm Apron, Feature A7B

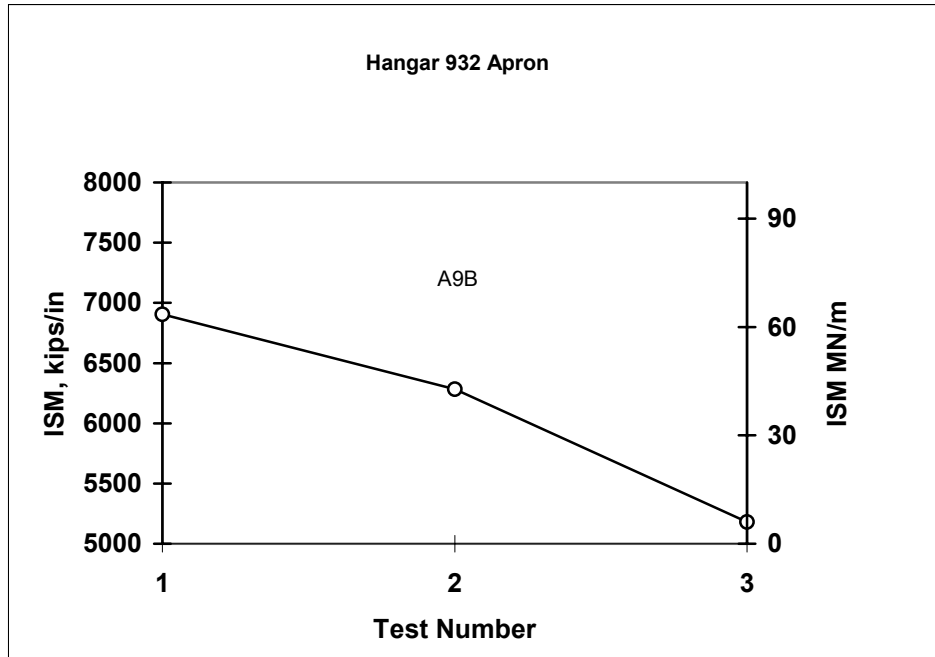


Figure B16. ISM profile, Hangar 932 Apron, Feature A9B

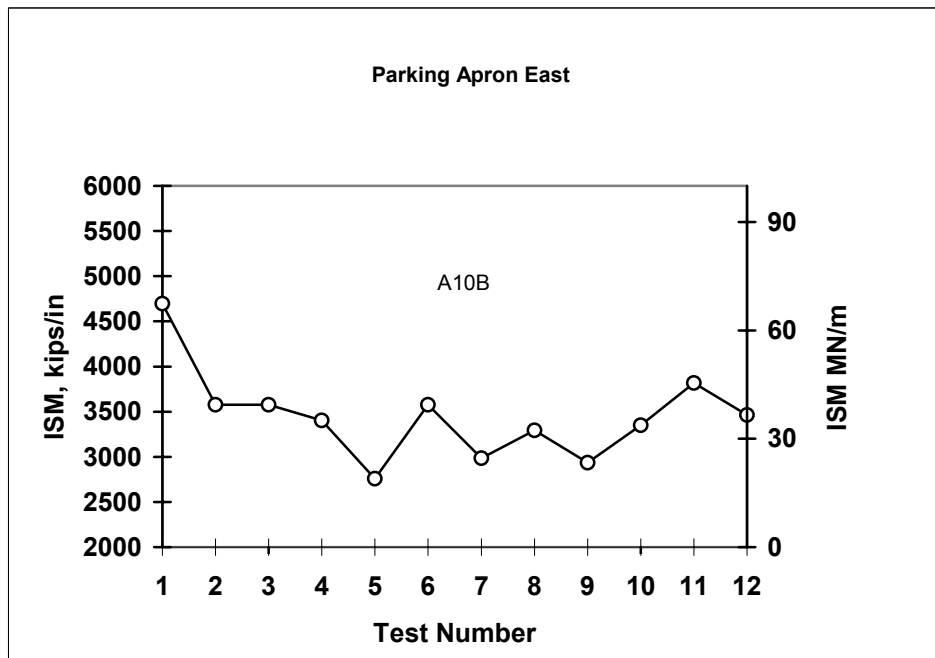


Figure B17. ISM profile, Parking Apron East, Feature A10B

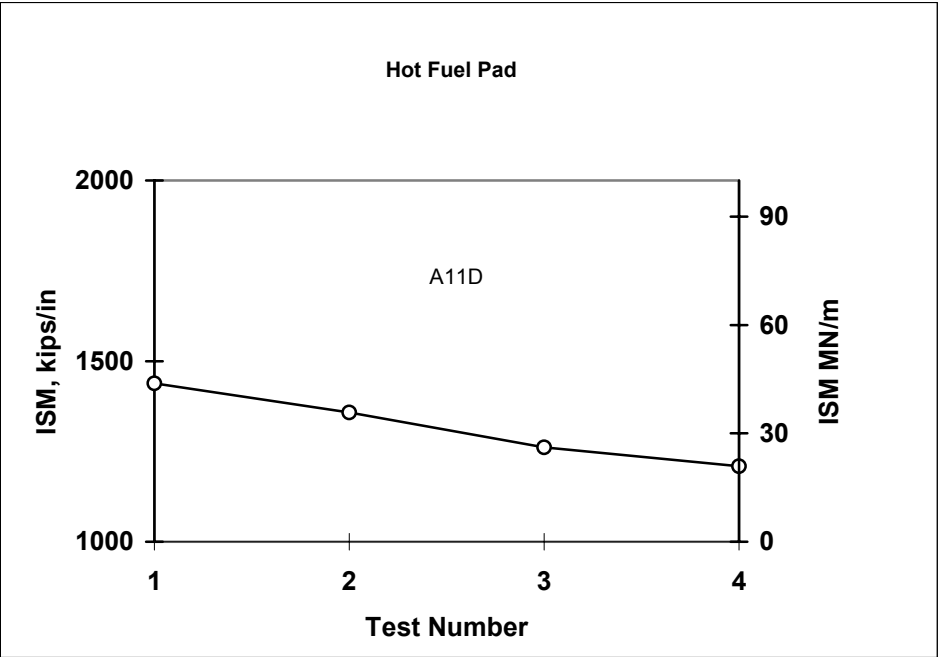


Figure B18. ISM profile, Hot Fuel Pad, Feature A11D

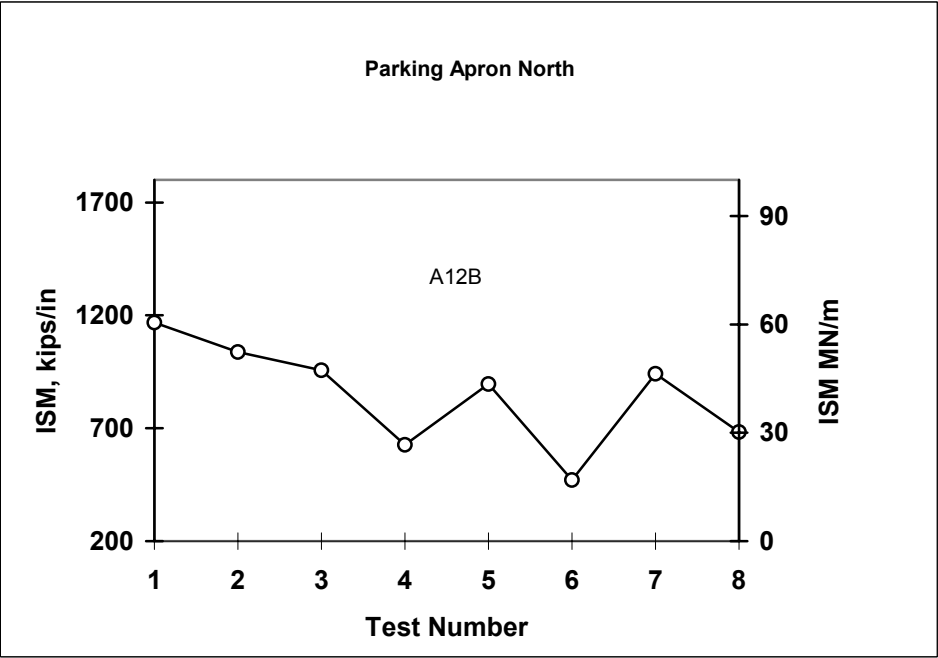


Figure B19. ISM profile, Parking Apron North, Feature A12B

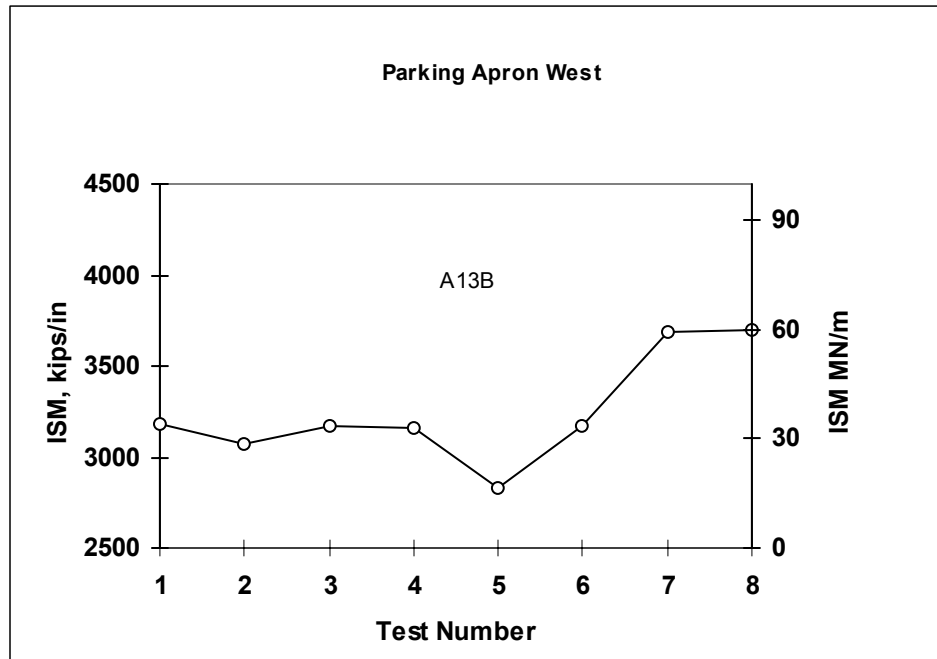


Figure B20. ISM profile, Parking Apron West, Feature A13B

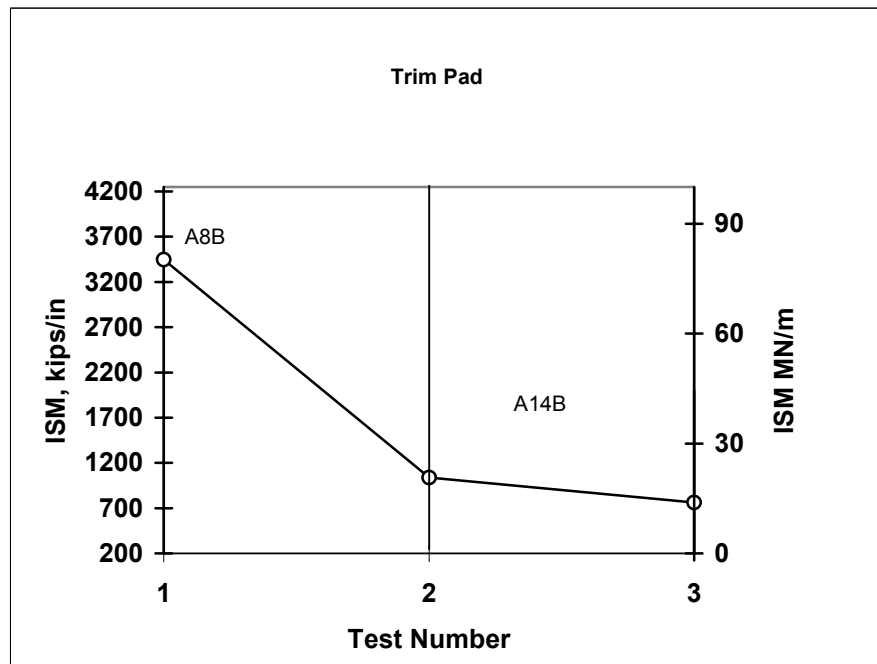


Figure B21. ISM profile, Trim Pad, Features A14B and A8B

Table B1									
NDT Test Results, Representative Basins									
Feature	ISM MN/m (kips/in.)	Load kN (lb)	Deflection, μ m (mils)						
			D1	D2	D3	D4	D5	D6	D7
Runway 9-27									
R1A	1314 (7505)	240 (53,963)	183 (7.2)	165 (6.5)	150 (5.9)	138 (5.4)	124 (4.9)	110 (4.3)	100 (3.9)
R3C	1183 (6753)	237 (53,216)	203 (8.0)	180 (7.1)	168 (6.6)	153 (6.0)	138 (5.4)	125 (4.9)	112 (4.4)
R5C	259 (1478)	220 (49,494)	850 (33.5)	556 (21.9)	368 (14.5)	264 (10.4)	197 (7.8)	156 (6.1)	125 (4.9)
R7C	1193 (6812)	227 (51,019)	190 (7.5)	173 (6.8)	157 (6.2)	142 (5.6)	127 (5.0)	113 (4.4)	99 (3.9)
R9A	1230 (7025)	227 (50,999)	184 (7.3)	161 (6.4)	146 (5.8)	135 (5.3)	121 (4.8)	110 (4.3)	96 (3.8)
Taxiway A									
T4A	162 (926)	211 (47,468)	1302 (51.3)	639 (25.2)	381 (15.0)	266 (10.5)	201 (7.9)	160 (6.3)	131 (5.2)
T6A	289 (1652)	170 (38,307)	589 (23.2)	344 (13.6)	227 (8.9)	163 (6.4)	121 (4.8)	94 (3.7)	79 (3.1)
T11A	477 (2725)	223 (50,106)	467 (18.4)	427 (16.8)	370 (14.6)	316 (12.4)	262 (10.3)	211 (8.3)	167 (6.6)
T15A	888 (5070)	229 (51,413)	258 (10.1)	212 (8.3)	201 (7.9)	186 (7.3)	168 (6.6)	150 (5.9)	131 (5.1)
T19A	1159 (6619)	233 (52,358)	201 (7.9)	178 (7.0)	160 (6.3)	145 (5.7)	129 (5.1)	114 (4.5)	102 (4.0)
T21A	876 (5003)	226 (50,781)	258 (10.2)	237 (9.3)	215 (8.5)	194 (7.6)	171 (6.7)	147 (5.8)	125 (4.9)
T25A	1161 (6629)	231 (51,842)	199 (7.8)	173 (6.8)	150 (5.9)	129 (5.1)	109 (4.3)	92 (3.6)	76 (3.0)
Taxiway B									
T9C	152 (871)	160 (36,007)	1050 (41.4)	412 (16.2)	202 (7.9)	138 (5.4)	106 (4.2)	88 (3.5)	82 (3.2)
T18C	1511 (8629)	233 (52,290)	154 (6.1)	136 (5.3)	122 (4.8)	111 (4.4)	99 (3.9)	90 (3.6)	83 (3.3)
T20C	706 (4033)	224 (50,245)	316 (12.5)	290 (11.4)	265 (10.4)	243 (9.6)	214 (8.4)	184 (7.2)	158 (6.2)
Taxiway C									
T17C	1299 (7415)	231 (51,981)	178 (7.0)	154 (6.1)	133 (5.2)	114 (4.5)	94 (3.7)	77 (3.0)	63 (2.5)
T24C	1169 (6675)	232 (52,064)	198 (7.8)	185 (7.3)	166 (6.5)	148 (5.8)	127 (5.0)	110 (4.3)	95 (3.7)
Taxiway D									
T3C	182 (1038)	164 (36,873)	902 (35.5)	518 (20.4)	310 (12.2)	214 (8.4)	158 (6.2)	123 (4.9)	102 (4.0)
T16C	174 (995)	162 (36,337)	927 (36.5)	623 (24.5)	398 (15.7)	278 (10.9)	203 (8.0)	158 (6.2)	131 (5.2)
(Continued)									

Table B1 (Concluded)									
Feature	ISM MN/m (kips/in.)	Load kN (lb)	Deflection, μm (mils)						
			D1	D2	D3	D4	D5	D6	D7
Taxiway E									
T22C	745 (4252)	1 264 615 (49,788)	297 (11.7)	275 (10.8)	250 (9.8)	225 (8.9)	195 (7.7)	166 (6.5)	140 (5.5)
Taxiway F									
T23C	636 (3631)	219 (49,132)	344 (13.5)	330 (13.0)	301 (11.8)	272 (10.7)	239 (9.4)	206 (8.1)	175 (6.9)
Taxiway G									
T7B	77 (442)	162 (36,361)	2088 (82.2)	514 (20.2)	263 (10.4)	181 (7.1)	136 (5.4)	109 (4.3)	91 (3.6)
Trim Pad Access									
T14A	48 (272)	156 (35,054)	3276 (129.0)	743 (29.3)	309 (12.2)	179 (7.0)	139 (5.5)	122 (4.8)	108 (4.3)
West Arm/Disarm Apron									
A1B	405 (2313)	219 (49,184)	540 (21.3)	509 (20.0)	459 (18.1)	409 (16.1)	354 (13.9)	298 (11.7)	249 (9.8)
East Arm/Disarm Apron									
A7B	496 (2830)	225 (50,507)	453 (17.9)	418 (16.5)	367 (14.4)	318 (12.5)	266 (10.5)	217 (8.6)	170 (6.7)
Hangar 504 Apron									
A3C	336 (1917)	216 (48,628)	644 (25.4)	625 (24.6)	572 (22.5)	509 (20.0)	433 (17.1)	356 (14.0)	280 (11.0)
Parking Apron North									
A5B	192 (1095)	216 (48,505)	1125 44.3	563 22.2	410 16.2	351 13.8	294 11.6	241 9.5	198 7.8
A12B	168 (957)	213 (47,921)	1283 (50.1)	581 (22.9)	396 (15.6)	303 (11.9)	230 (9.1)	177 (7.0)	138 (5.4)
Alert Apron									
A6B	484 (2764)	225 (50,658)	466 (18.3)	395 (15.6)	317 (12.5)	253 (10.0)	196 (7.7)	148 (5.8)	109 (4.3)
Trim Pad									
A8B	604 (3447)	175 (39,396)	290 (11.4)	251 (9.9)	206 (8.1)	165 (6.5)	126 (5.0)	92 (3.6)	65 (2.6)
A14B	182 (1040)	164 (36,877)	902 (35.5)	795 (31.3)	569 (22.4)	391 (15.4)	262 (10.3)	180 (7.1)	135 (5.3)
Hangar 932 Apron									
A9C	907 (5180)	228 (51,333)	252 (9.9)	199 (7.8)	175 (6.9)	152 (6.0)	128 (5.1)	106 (4.2)	86 (3.4)
Parking Apron East									
A10B	627 (3578)	221 (49,768)	353 (13.9)	347 (13.7)	317 (12.5)	290 (11.4)	255 (10.1)	220 (8.7)	186 (7.3)
Hot Fuel Pad									
A11D	212 (1209)	210 (47,285)	993 (39.1)	956 (37.7)	842 (33.1)	729 (28.7)	616 (24.3)	507 (20.0)	409 (16.1)
Parking Apron West									
A13B	557 (3183)	221 (49,724)	397 (15.6)	376 (14.8)	347 (13.7)	318 (12.5)	283 (11.1)	246 (9.7)	212 (8.3)

Table B2 Summary of Modulus Values¹				
Feature	Surface Modulus MPa (psi¹)	Base Modulus MPa (psi¹)	Subbase Modulus MPa (psi¹)	Subgrade Modulus MPa (psi¹)
PCC Pavements				
A1B	57 772 (8,379,165)	215 (31,106)	86 (12,480) ²	86 (12,480) ²
A3C	41 430 (6,008,891)	192 (27,843)	74 (10,703) ²	74 (10,703) ²
A6B	32 570 (4,723,859)	398 (57,740)	--	217 (31,434)
A7B	48 605 (7,049,547)	293 (42,527)	135 (19,568) ²	135 (19,568) ²
A8B	30 361 (4,403,500)	449 (65,158)	265 (38,478) ²	265 (38,478) ²
A9C	45 015 (6,528,870)	296 (42,880) ²	296 (42,880) ²	296 (42,880) ²
A10B	55 931 (8,112,175)	106 (15,371) ²	106 (15,371) ²	106 (15,371) ²
A11D	98 265 (14,252,099)	151 (21,848)	--	53 (7708)
A13B	50 986 (7,394,885)	259 (37,578)	259 (37,578)	91 (13,605)
A14B	18 490 (2,700,262)	258 (37,698)	112 (16,400) ²	112 (16,400) ²
R1A	74 749 (10,841,147)	447 (64,876)	215 (31,123) ²	215 (31,123) ²
R3C	71 987 (10,440,826)	405 (58,715)	181 (26,190) ²	181 (26,190) ²
R7C	61 698 (8,948,495)	438 (63,528)	207 (29,989) ²	207 (29,989) ²
R9A	67 163 (9,741,169)	444 (64,359)	212 (30,684) ²	212 (30,684) ²
T11A	44 191 (6,409,415)	301 (43,619)	140 (20,321) ²	140 (20,321) ²
T15A	50 960 (7,383,801)	367 (53,232)	154 (22,278) ²	154 (22,278) ²
T18C	86 916 (12,606,067)	493 (71,486)	256 (37,193) ²	256 (37,193) ²
T19A	57 663 (8,363,293)	445 (64,542)	213 (30,838) ²	213 (30,838) ²
T17C	66 290 (5,109,890)	601 (87,216)	391 (56,765) ²	391 (56,765) ²
T21A	34 500 (9,614,567)	393 (57,053)	172 (24,960) ²	172 (24,960) ²
T22C	53 066 (7,696,598)	362 (52,510)	362 (52,510)	150 (21,793)
T23C	51 809 (7,514,227)	300 (43,582)	300 (43,582)	112 (16,294)
T24C	81 779 (11,861,067)	480 (69,687)	480 (69,687)	244 (35,449)
T25A	58 265 (8,450,591)	562 (81,508)	562 (81,508)	335 (48,540)
AC Pavements³				
A5B	1709 (247,864)	1857 (269,389)	--	135 (19,527)
A12B	1685 (244,441)	750 (108,559)	--	174 (25,215)
(Continued)				
¹ Backcalculated modulus values using WESDEF.				
² Base and/or subbase and subgrade were combined.				
³ AC modulus based on temperature at the time of testing.				

Table B2 (Concluded)				
Feature	Surface Modulus MPa (psi¹)	Base Modulus MPa (psi¹)	Subbase Modulus MPa (psi¹)	Subgrade Modulus MPa (psi¹)
AC Pavements				
R5C	3298 (478,262)	970 (140,686)	188 (27,235) ²	188 (27,235) ²
T3C	3312 (480,366)	207 (30,000)	207 (30,000)	276 (39,986)
T4A	1847 (267,875)	352 (51,003)	187 (27,185) ²	187 (27,185) ²
T6A	4249 (616,316)	256 (37,126) ²	256 (37,126) ²	256 (37,126) ²
T7B	2741 (397,479)	366 (53,092)	--	189 (27,474)
T9C	3143 (455,896)	569 (82,539)	236 (34,180) ²	236 (34,180) ²
T14A	3153 (457,340)	448 (64,963)	--	264 (38,281)
T16C	3787 (549,271)	401 (58,162)	401 (58,162)	134 (19,435)
T20C	2499 (362,521)	689 (100,000)	856 (124,147) ²	856 (124,147) ²
¹ Backcalculated modulus values using WESDEF.				
² Base and/or subbase and subgrade were combined.				
³ AC modulus based on temperature at the time of testing.				

Appendix C

Pavement Condition Survey and Results

Pavement Condition Survey

A pavement condition survey is a visual inspection of the airfield pavements to determine the present surface condition. The condition survey consists of inspecting the pavement surface for various types of distress, determining the severity of each distress, and measuring the quantity of each distress. The estimated quantities and severity of each distress type are used to compute the PCI for each feature. The PCI is a numerical indicator based on a scale from 0 to 100 and is determined by measuring pavement surface distress that reflects the surface condition of the pavement. Pavement condition ratings (from excellent to failed) are assigned to different levels of PCI values. These ratings and their respective PCI value definitions are shown in Figure C1. The distress types, severity levels, methods of survey, and PCI calculations are described in ASTM D5340-93.

The PCI and estimated distress quantities are determined for each feature. The information is based on inspection of a selected number of sample units. Sample units are subdivisions of a feature used exclusively to facilitate the inspection process and reduce the effort needed to determine distress quantities and the PCI. Each feature was divided into sample units. The sample units for AC pavement features were approximately 465 sq m (5,000 sq ft). A statistical sampling technique was used to determine the number of sample units to be inspected to provide a 95 percent confidence level. Sample units were chosen along the centerline of the taxiways and randomly on the runway and on the aprons. Sample unit locations for the various runway features are shown in Figures C2. Sample unit locations for the PCC taxiway and apron features are shown in Figures C3 through C17. The surveyed sample units are circled. After the sample units were inspected, the mean PCI of all sample units within a feature was calculated and the feature was rated as to its condition: excellent, very good, good, fair, poor, very poor, or failed.

Analysis of PCI Data

The distress information collected during the survey was used with the Micro PAVER computer program to estimate the quantities of distress types for each feature. This information is presented along with the PCI, general rating, and distress mechanism (load, climate, or other) in Appendix E. Photos C1 through C12 show various types of distresses observed during the survey.

AR 420-72 (Headquarters, Department of the Army 2000) requires that all airfield pavements be maintained at or above the following PCI ranges:

- All runways > 70
- All primary taxiways ≥ 60
- All aprons and secondary taxiways > 55

AR 420-72 (Headquarters, Department of the Army 2000) also requires that the following PCI range for airfield pavements shall be used for the Installation Status Report (ISR) rating:

- $70 < \text{PCI} \leq 100$ equals an ISR Green rating
- $55 < \text{PCI} \leq 70$ equals an ISR Amber rating
- $0 < \text{PCI} \leq 55$ equals an ISR Red rating

The PCI for each sample unit inspected was calculated and stored on a Micro PAVER file for VFANG. The mean PCI for each feature was then calculated to determine the general condition or rating of the feature as shown in Figure C18. A comparison of the 2002, 2000, and 1992 PCI results is summarized in Table C1. The PCI of the runway features increased from one to seven points during the 2000 to 2002 period. The joint and corner spalling noted in 2000 had been filled with joint sealant, so the increase in PCI points is considered normal. The PCI of all but three of the taxiway features and all but five of the apron features increased from three to sixty-one points during the 2000 to 2002 period. Two taxiway features and three apron features had an increase in PCI of one to five points which was attributed to judging the distresses less severe in 2002 as compared to their severity in 2000. The PCI of Feature T24C increased by thirty-four points, and the PCI of Feature T9C increased by sixty-one points. It was also noted that the PCI of Feature A14B decreased twenty points.

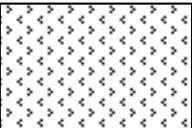

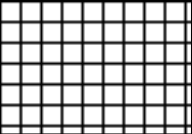
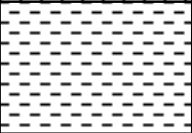
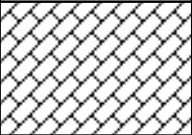

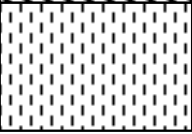
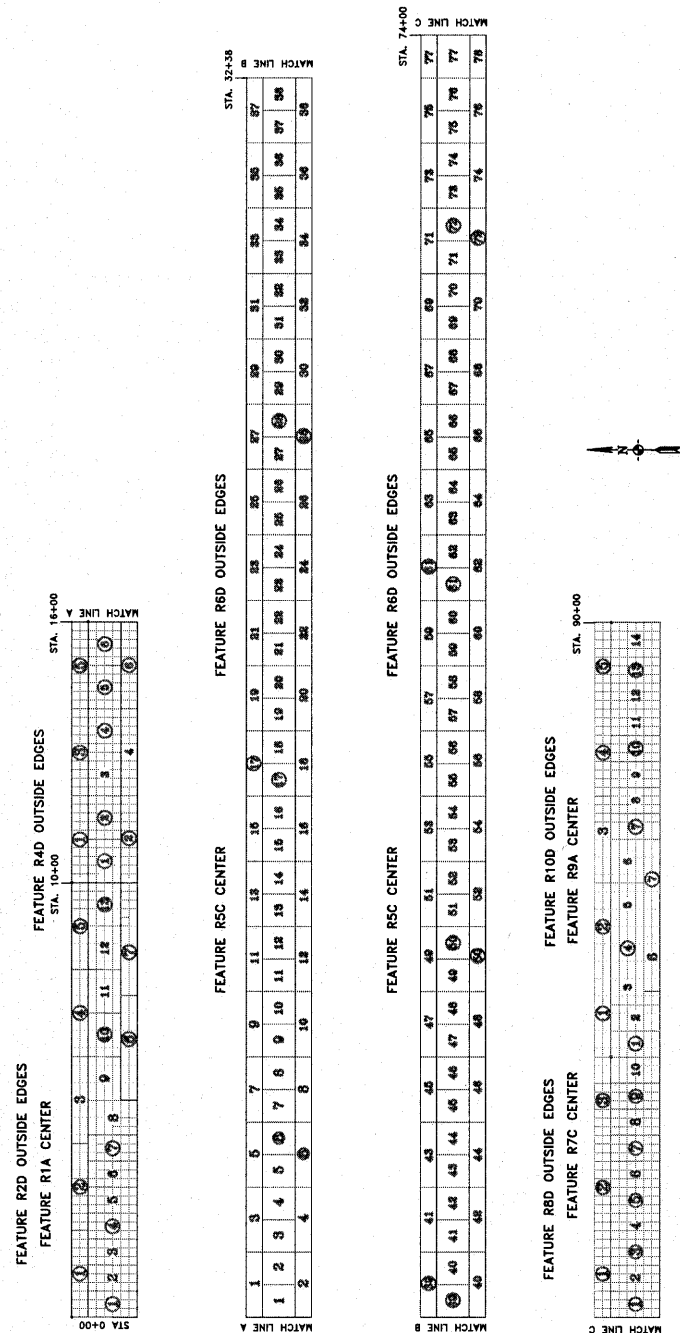
PAVEMENT CONDITION INDEX (PCI)		PAVEMENT CONDITION RATING
100		EXCELLENT
86		
85		VERY GOOD
71		
70		GOOD
56		
55		FAIR
41		
40		POOR
26		
25		VERY POOR
11		
10		FAILED
0		

Figure C1. Scale for pavement condition rating



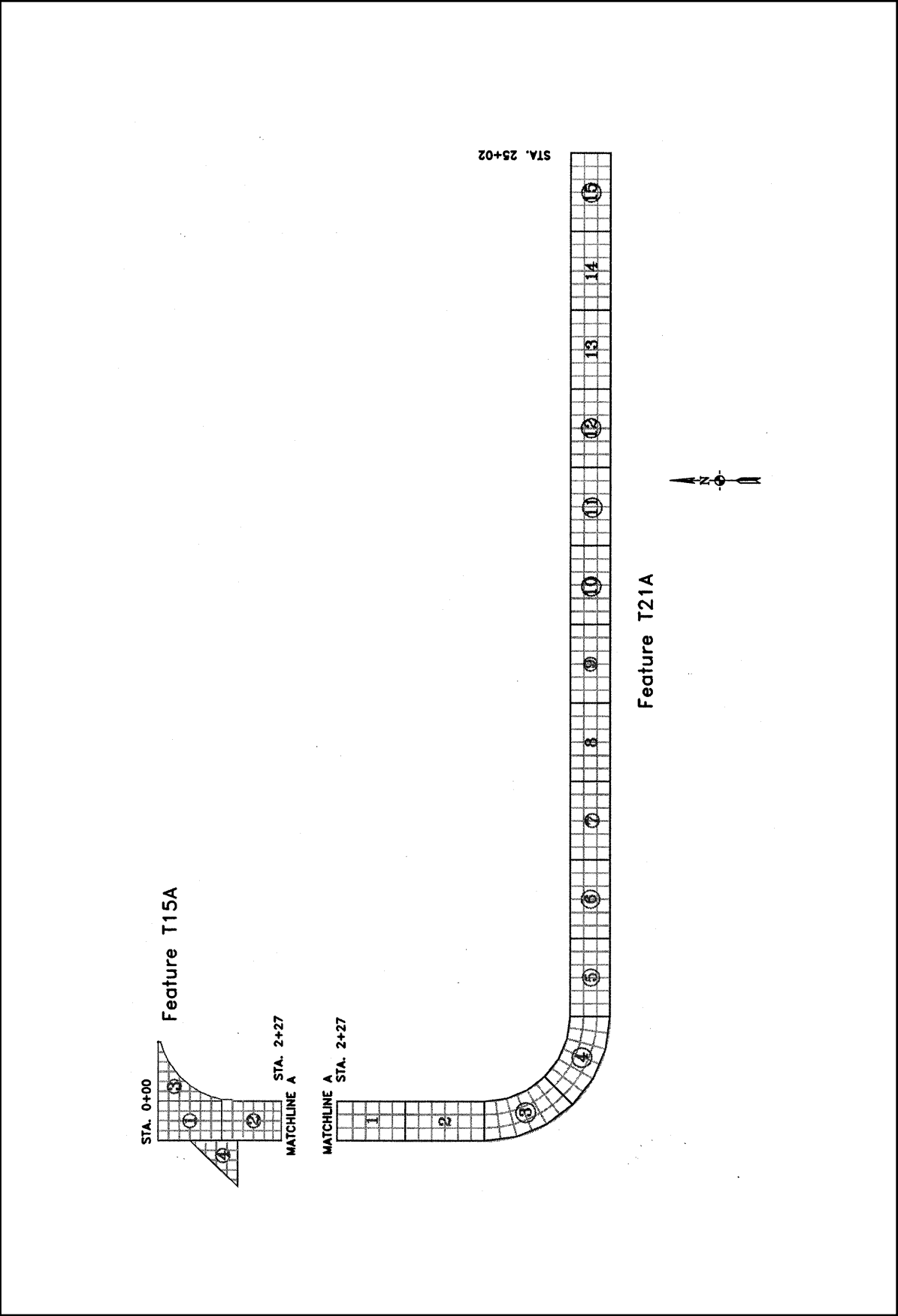


Figure C3. Sample unit layout, Taxiway A, Features T15A and T21A

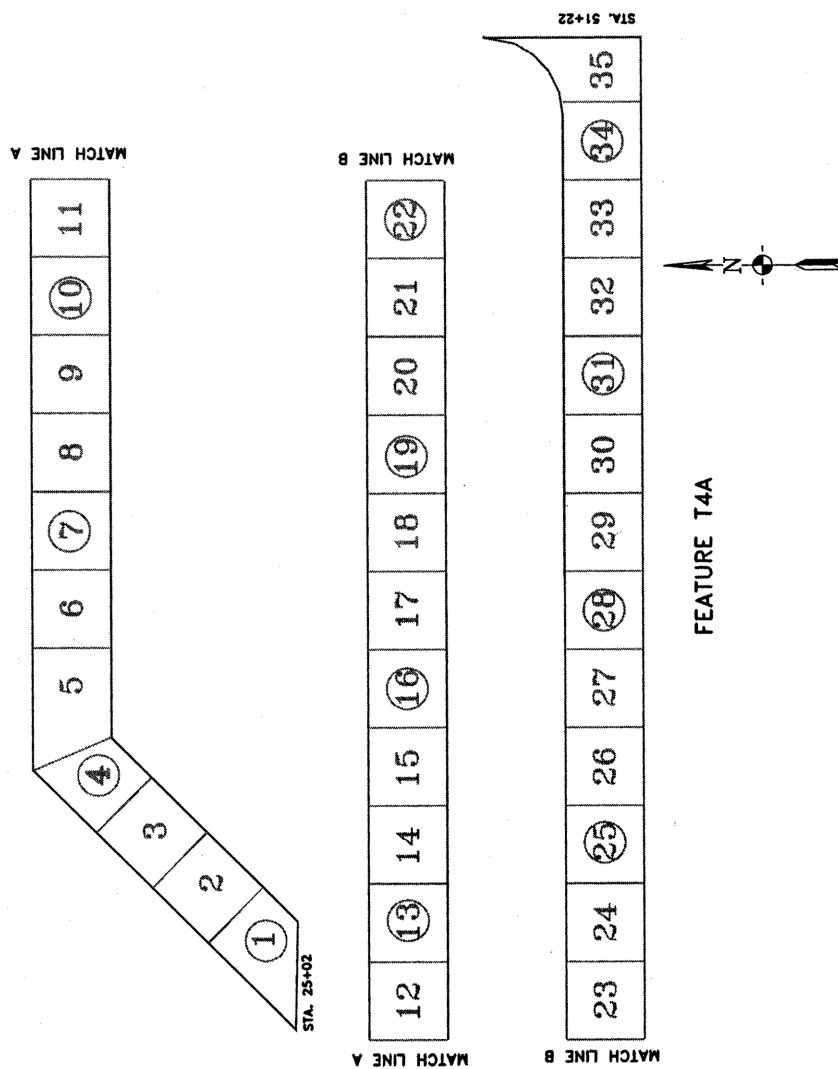


Figure C4. Sample unit layout, Taxiway A, feature T4A

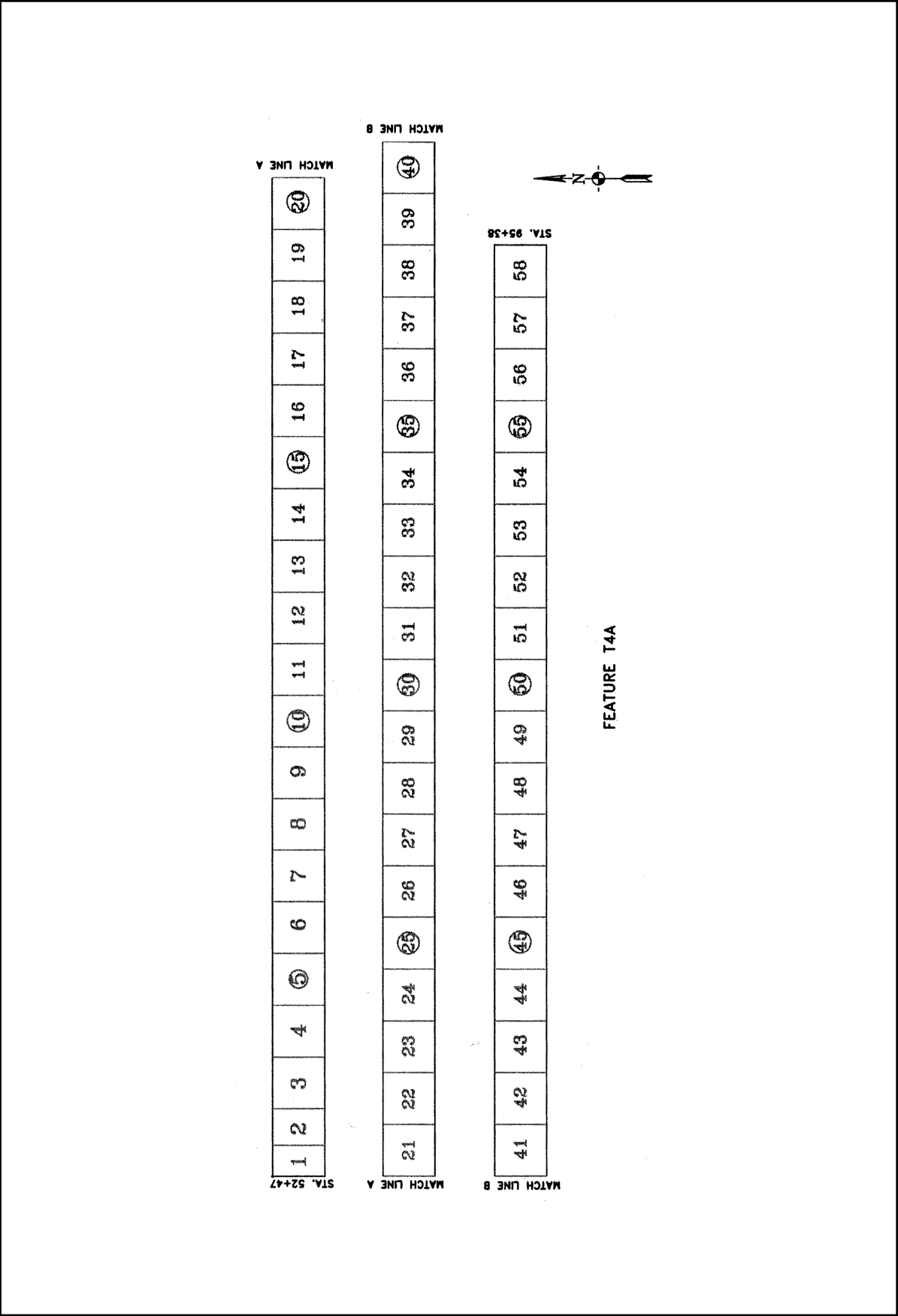


Figure C5. Sample unit layout, Taxiway A, feature T6A

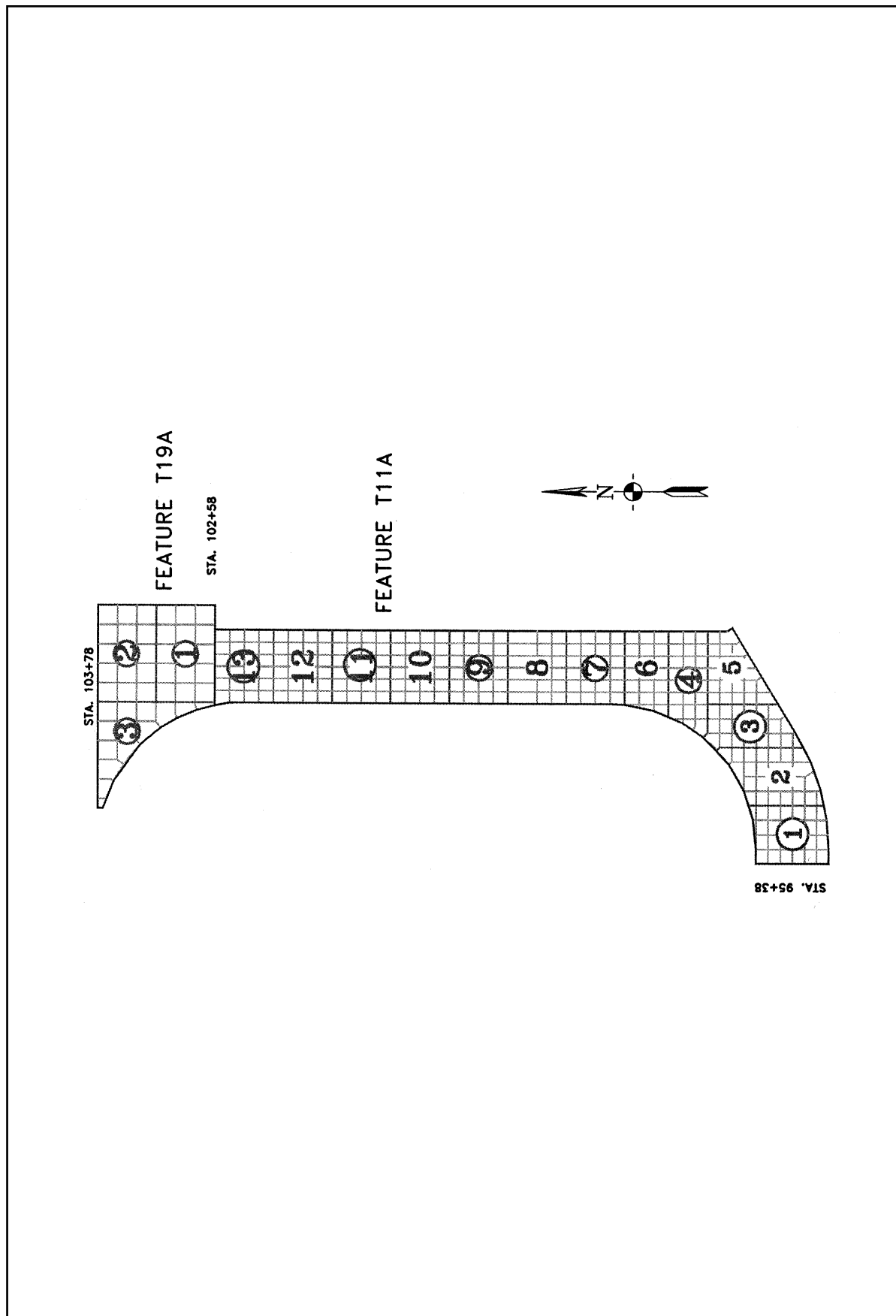


Figure C6. Sample unit layout, Taxiway A, features T19A and T11A

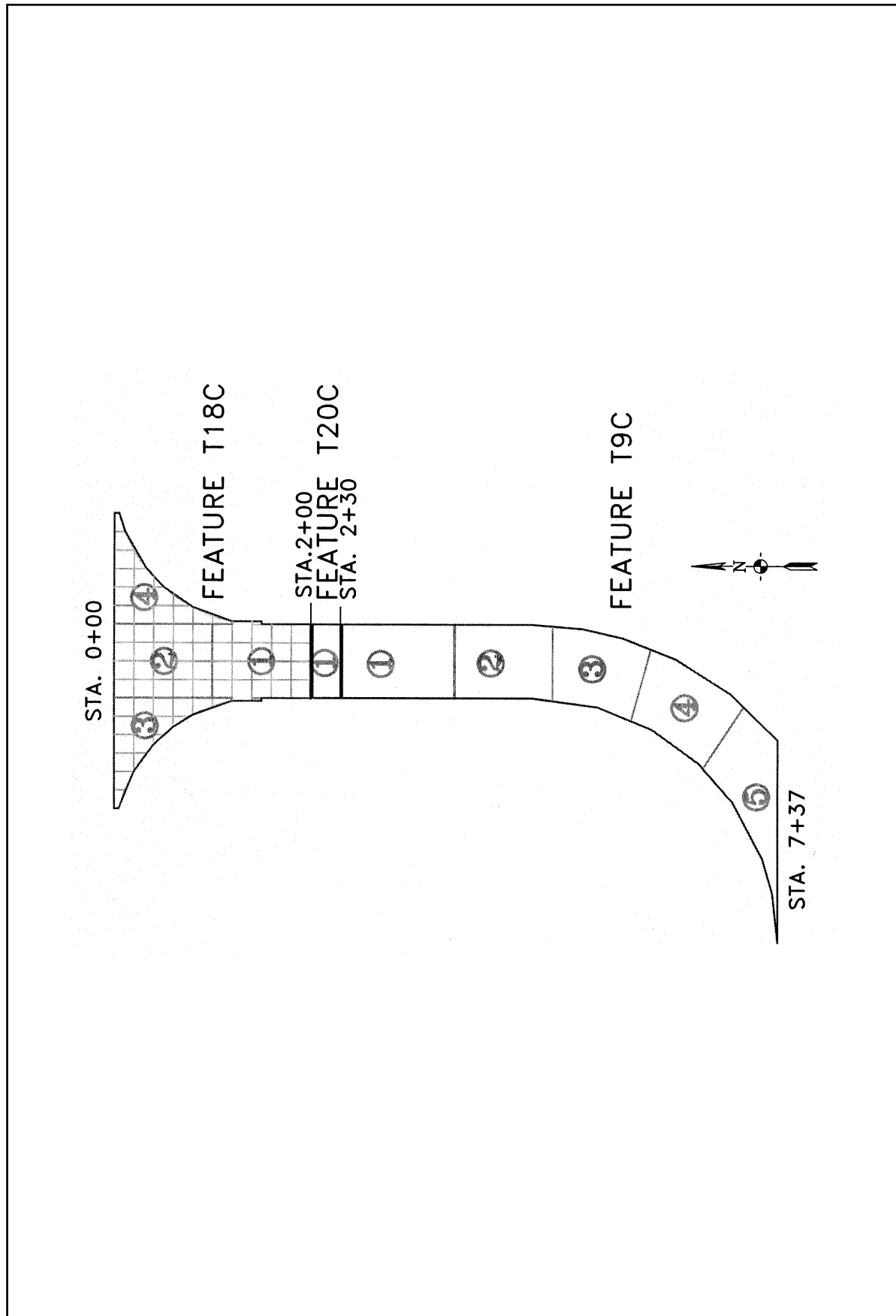


Figure C7. Sample unit layout, Taxiway B, features T18C, T20C, and T9C

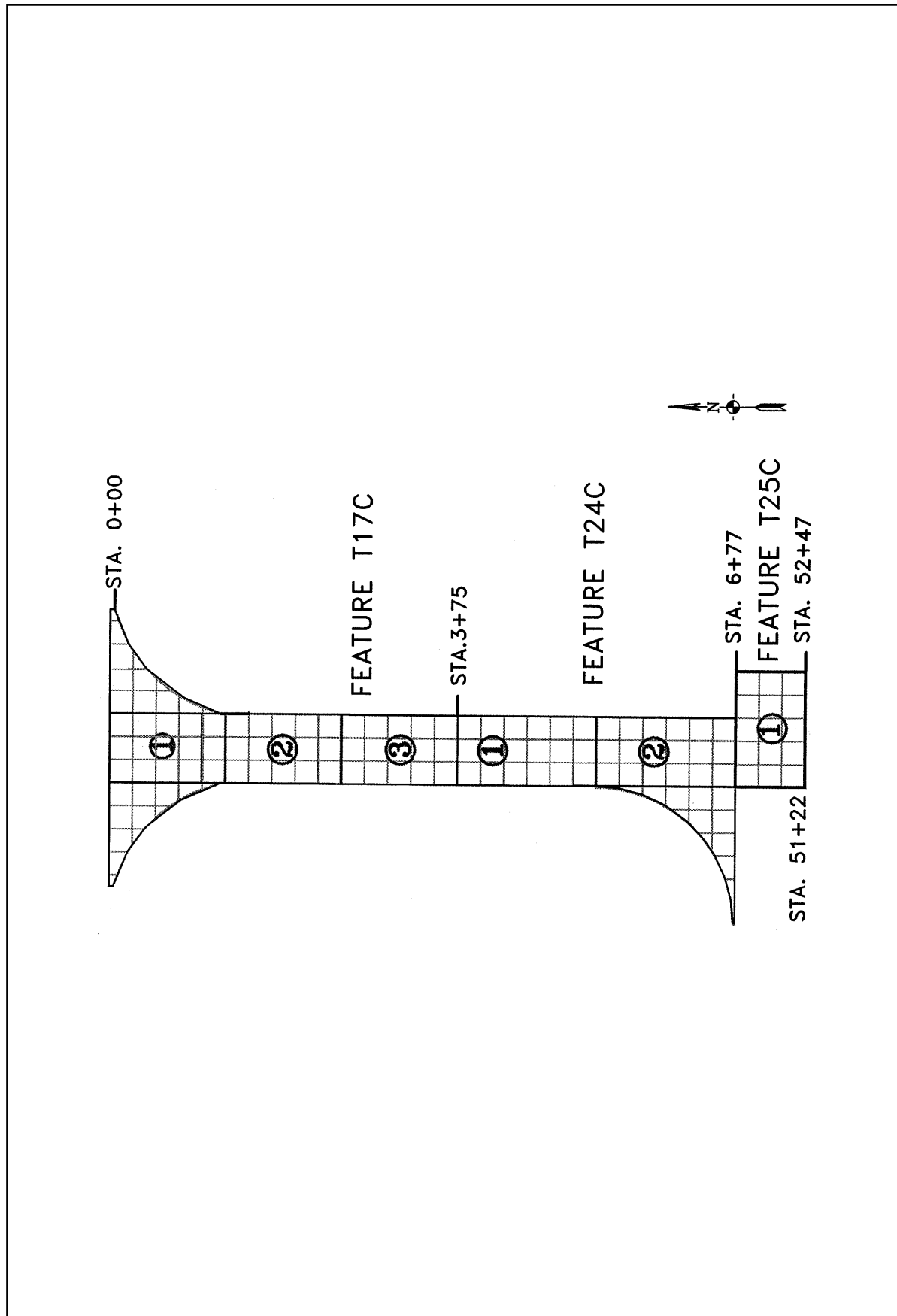


Figure C8. Sample unit layout, Taxiway C, features T17C, T24C, and T25C of Taxiway A

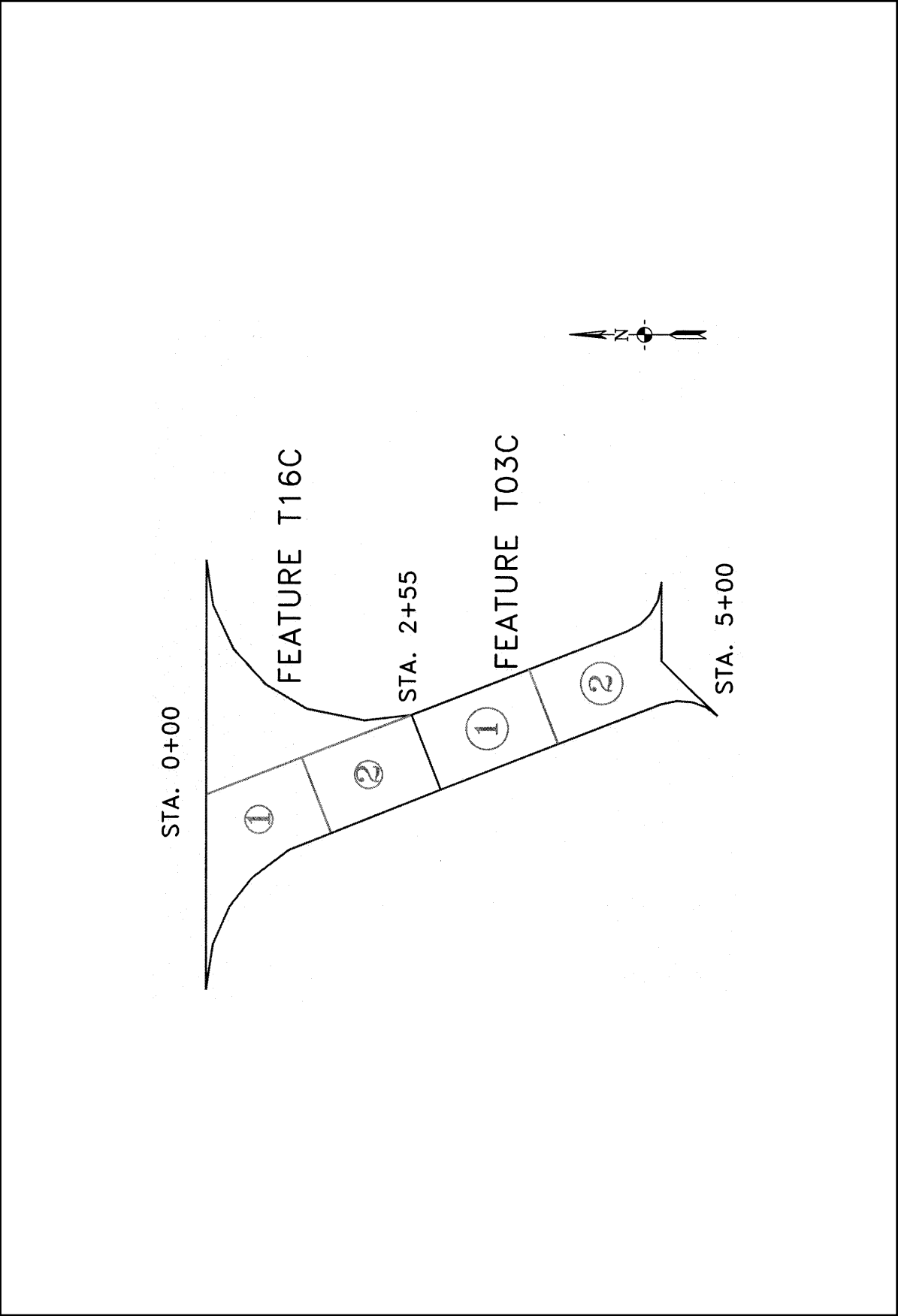


Figure C9. Sample unit layout, Taxiway D, features T16C and T3C

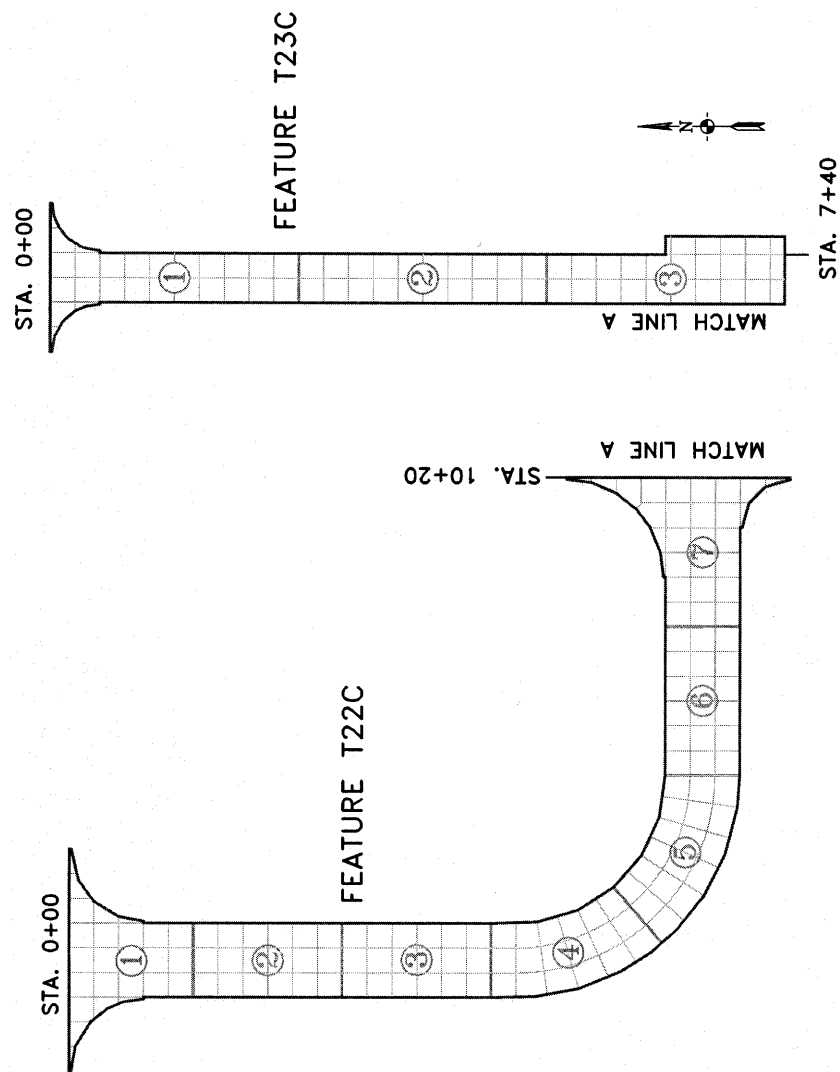


Figure C10. Sample unit layout, Taxiways E and F, features T22C and T23C

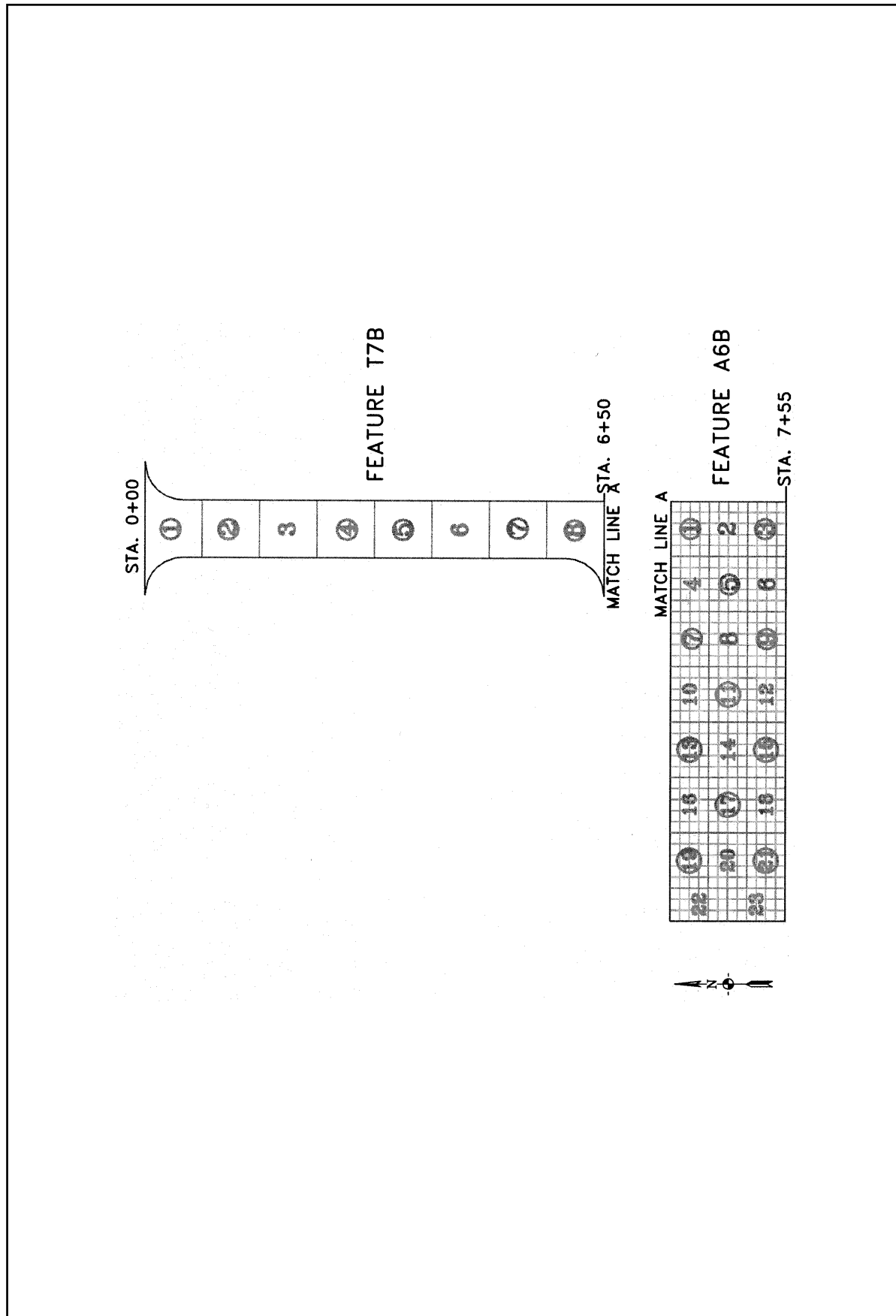


Figure C11. Sample unit layout, Taxiway G and Alert Apron, feature T7B and feature A6B

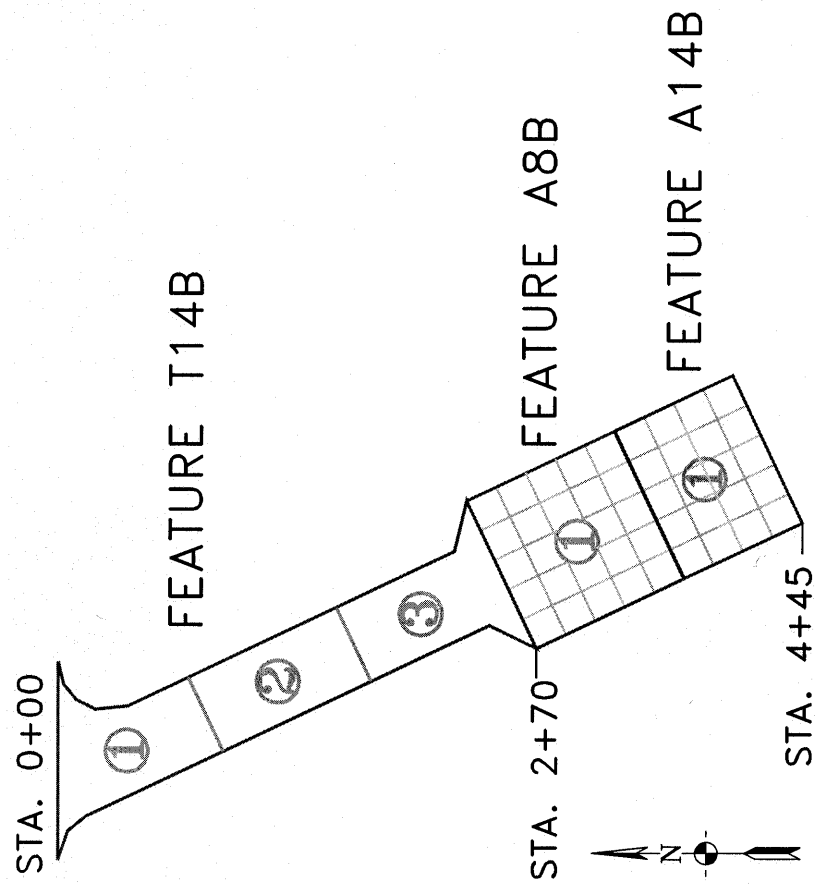


Figure C12. Sample unit layout, Trim Pad, features T14B, A8B, and A14B

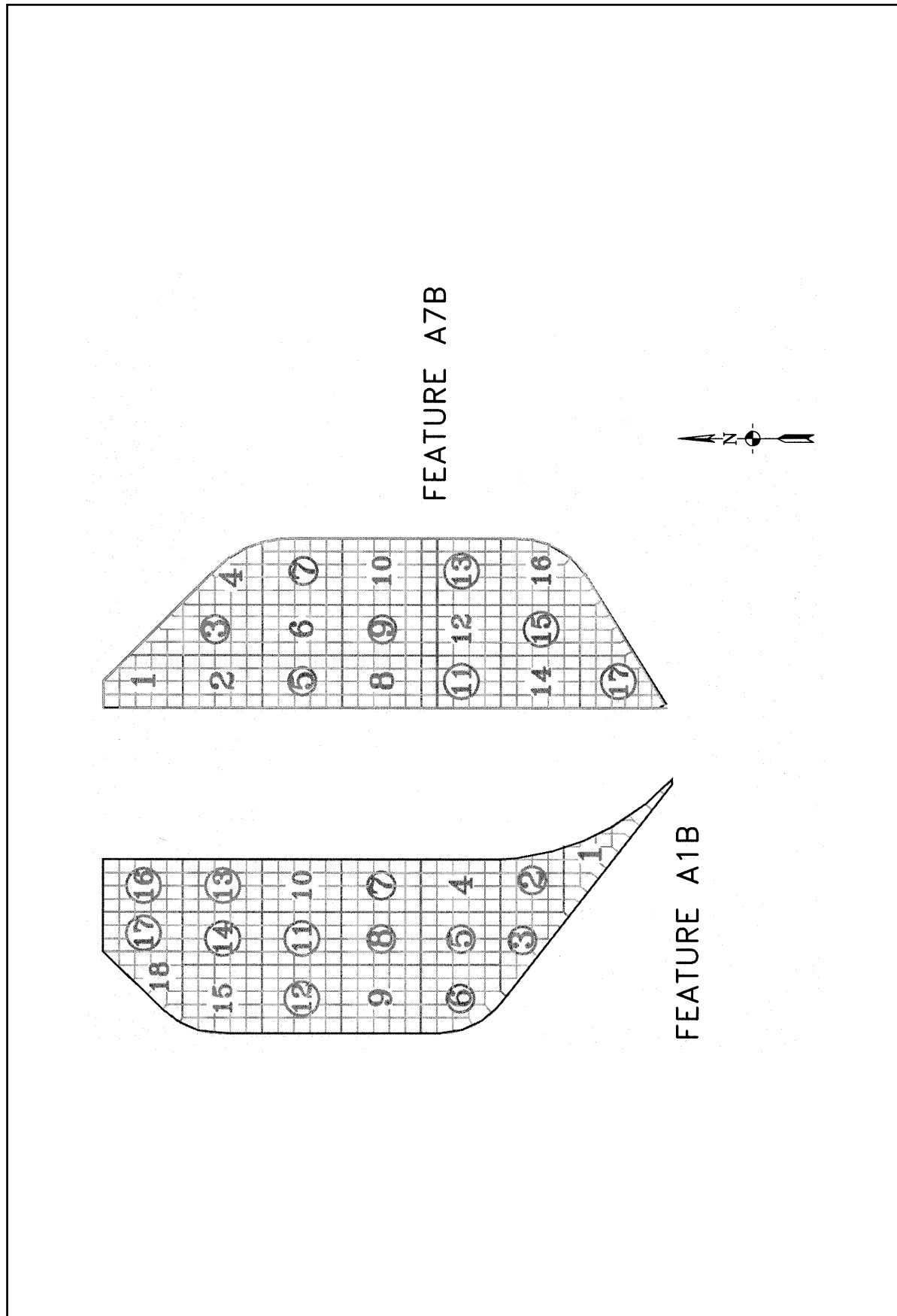


Figure C13. Sample unit layout, West and East Arm/Disarm Aprons, feature A1B and A7B respectively

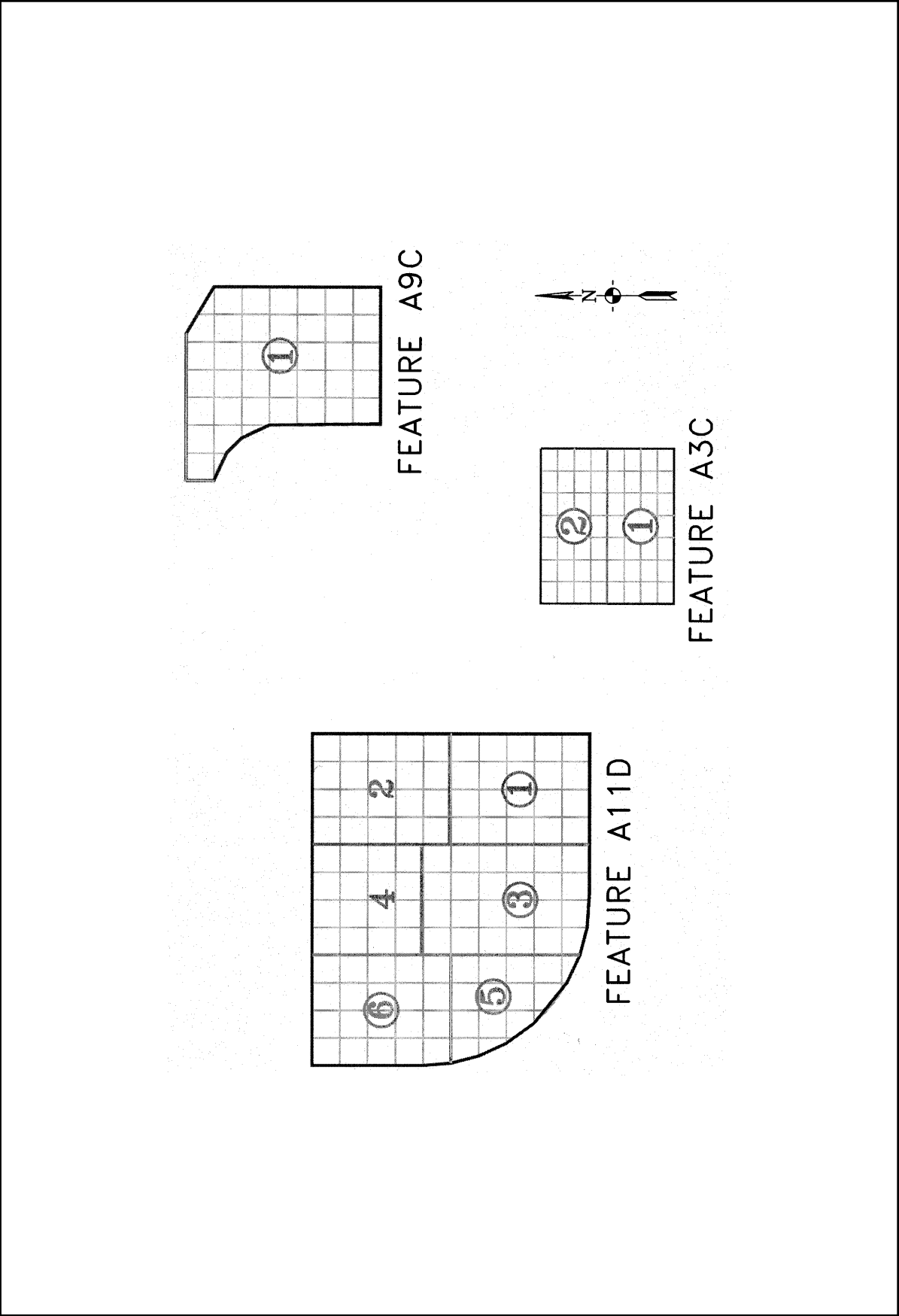


Figure C14. Sample unit layout, c. clockwise: Hot Fuel Pad, Hangar 504 Apron, and Hangar 932 Apron, features A11D, A3C, and A9C

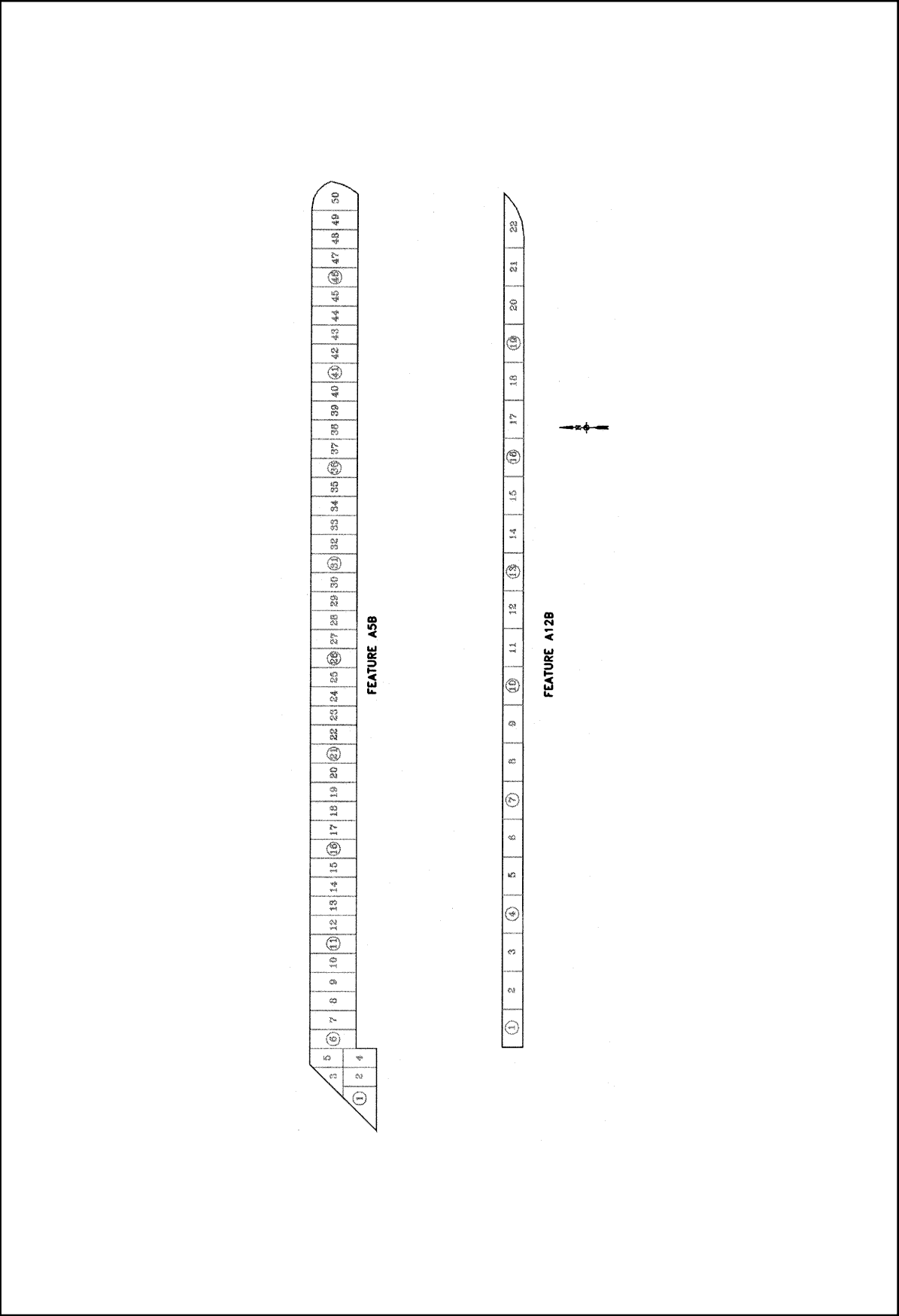


Figure C15. Sample unit layout, Parking Apron North, features A5B and A12B

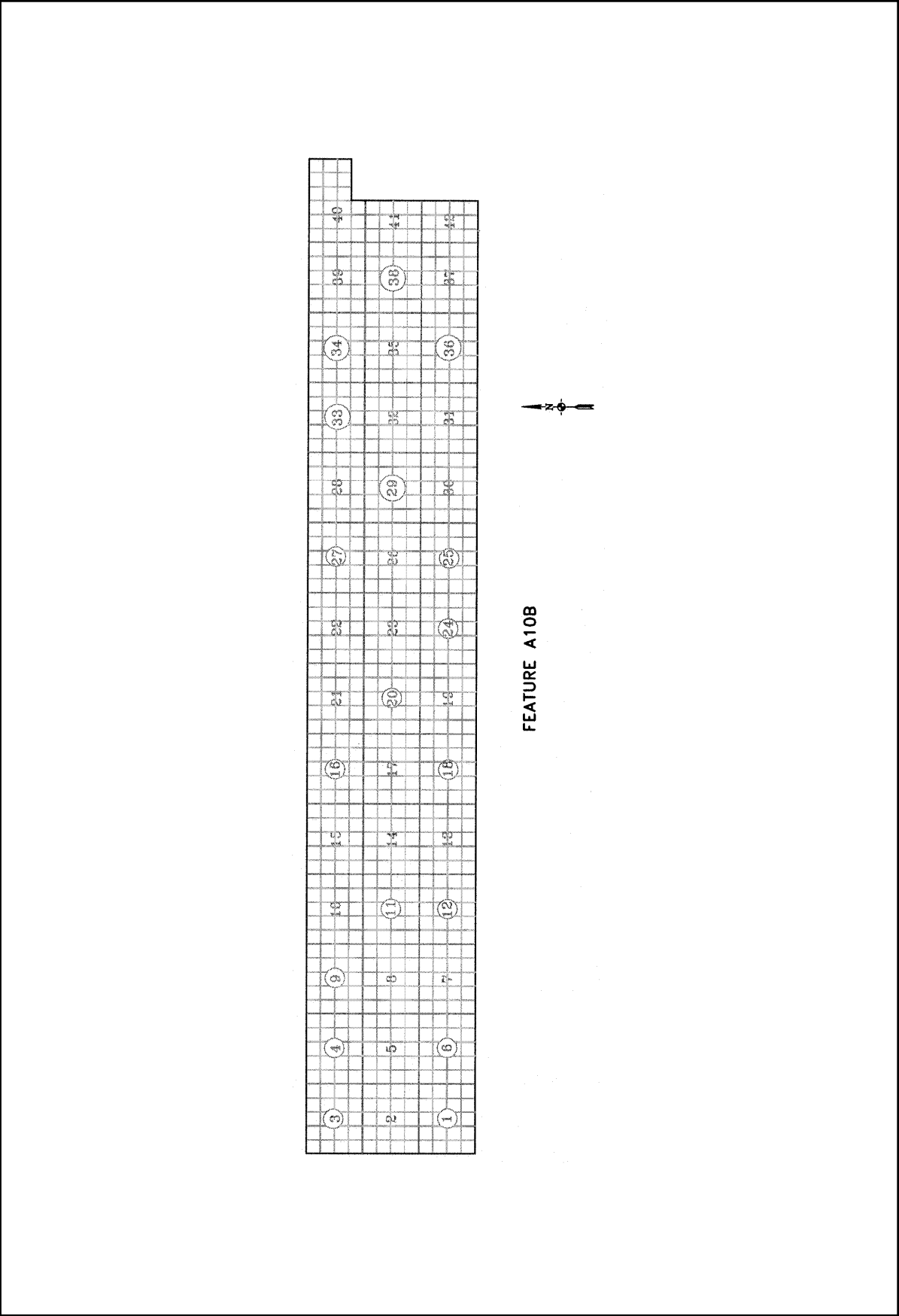
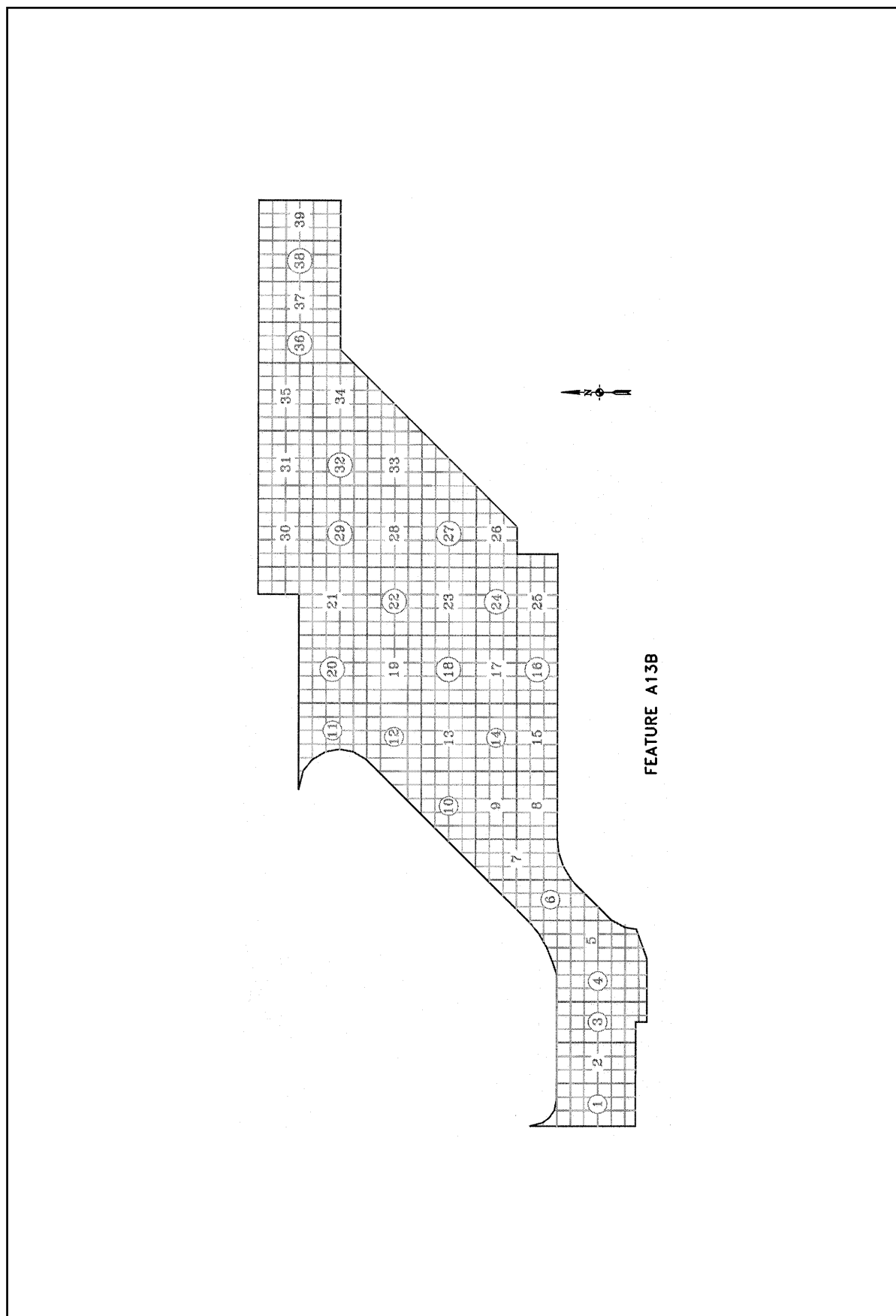


Figure C16. Sample unit layout, Parking Apron East, feature A10B



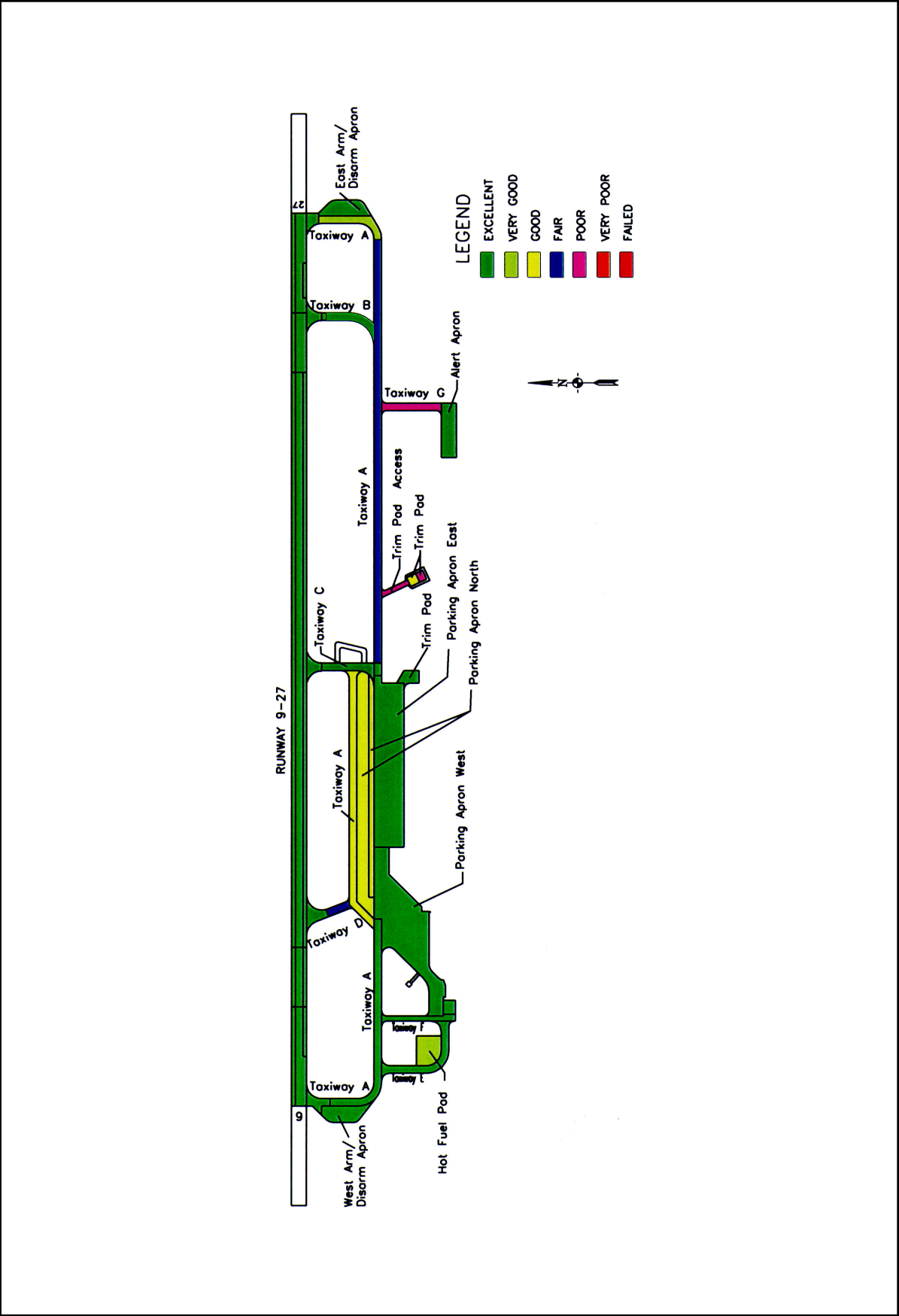


Figure C18. Pavement condition rating summary

Table C1
Comparison of 1992, 2000, and 2002 PCI Surveys

Feature	1992 PCI	2000 PCI	2002 PCI	2002 Rating	Change in PCI From 2000 to 2002 (+ or -)	Pavement Type
Runways						
R1A	64	94	100	Excellent	+6	PCC
R2D	88	98	98	Excellent	0	PCC
R3C	52	93	100	Excellent	+7	PCC
R4D	53	93	99	Excellent	+6	PCC
R5C	96	99	100	Excellent	+1	AC
R6D	56	100	99	Excellent	-1	PCC
R7C	71	95	100	Excellent	+5	PCC
R8D	37	94	99	Excellent	+5	PCC
R9A	88	92	99	Excellent	+7	PCC
R10D	85	99	99	Excellent	0	PCC
Taxiways						
T3C	54	51	53	Fair	+2	AC
T4A	59	63	63	Good	0	AC
T6A	60	26	47	Fair	+21	AC
T7B	64	43	38	Poor	-5	AC
T9C	49	39	100	Excellent	+61	AC
T11A	88	65	83	Very Good	+18	PCC
T14B	74	41	34	Poor	-7	AC
T15A	86	87	100	Excellent	+13	PCC
T16A	-- ¹	96	100	Excellent	+4	AC
T17C	58	92	100	Excellent	+8	PCC
T18C	71	82	96	Excellent	+14	PCC
T19A	88	90	100	Excellent	+10	PCC
T20C	49	96	100	Excellent	+4	AC
T21A	52	77	87	Excellent	+10	PCC
T22C	-- ¹	92	99	Excellent	+7	PCC
T23C	-- ¹	85	91	Excellent	+6	PCC
T24C	58	62	94	Excellent	+32	PCC
T25A	59	78	97	Excellent	+19	PCC
<i>(Continued)</i>						

Table C1 (Concluded)						
Comparison of 1992, 2000, and 2002 PCI Surveys						
Feature	1992 PCI	2000 PCI	2002 PCI	2002 Rating	Change in PCI From 2000 to 2002 (+ or -)	Pavement Type
Aprons and Ramps						
A1B	83	82	93	Excellent	+10	PCC
A3C	82	91	89	Excellent	-2	PCC
A5B	46	59	67	Good	+8	AC
A6B	93	89	87	Excellent	-2	PCC
A7B	89	82	91	Excellent	+9	PCC
A8B	75	69	61	Good	-3	PCC
A9C	77	94	97	Excellent	+3	PCC
A10B	46	92	95	Excellent	+3	PCC
A11D	-- ¹	63	76	Very Good	+13	PCC
A12B	46	86	67	Good	-19	PCC
A13B	46	88	92	Excellent	+4	PCC
A14B	75	55	35	Poor	-20	PCC
¹ Not surveyed prior to 1992.						
² Not surveyed prior to 2000.						

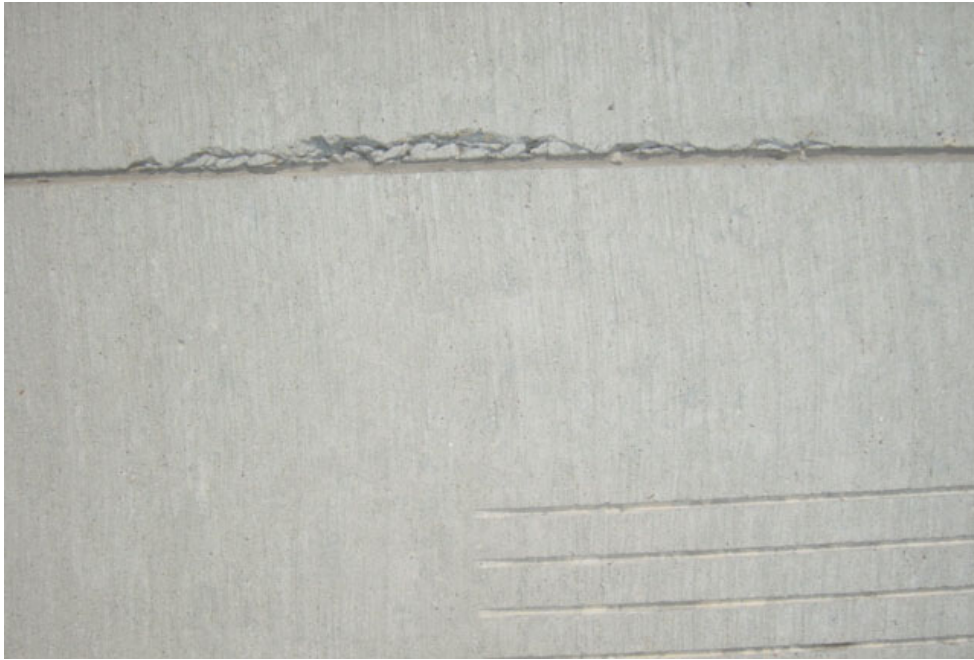


Photo C1. Runway 9-27, Feature R1A, low-severity spalling joint



Photo C2. Runway 9-27, Feature R2D, low-severity spalling corner



Photo C3. Taxiway A, T4A, low-severity raveling/weathering



Photo C4. Taxiway A, Feature T4A, low-severity longitudinal/traverse cracking



Photo C5. Taxiway A, Feature T6AB, low-severity alligator cracking



Photo C6. Taxiway A, Feature T21A, medium-severity small patching



Photo C7. Taxiway E, Feature T22C, low-severity longitudinal cracking



Photo C8. Taxiway D, Feature T3C, low-severity depression



Photo C9. Trim Pad Access, Feature T14B, vegetation in the high-severity cracks



Photo C10. Trim Pad, Feature A8B, medium-severity shattered slab

Appendix D

Structural Analyses

General

The performance of the airfield pavement facilities was analyzed for either the mixture of traffic shown in Table A4 or for specific aircraft traffic based on usage.

The mixture of aircraft traffic listed in Table A4 was converted to equivalent traffic of the critical aircraft based on the procedure outlined in TM 5-825-2/DM 21.3/AFM 88-6, Chapter 2 (Headquarters, Departments of the Army, the Air Force, and the Navy 1978). The critical aircraft is defined as that aircraft within a mixture of various aircraft operating at a facility that will impose a more severe combination of gear load and tire pressure than the other assigned aircraft at their respective pass levels. For the projected aircraft traffic mixture, the critical aircraft within the mixture was determined and the number of passes of the critical aircraft required to produce an effect on the pavement equivalent to the total mixture of traffic was computed. The current Corps of Engineers (CE) design criteria is utilized to analyze and equate the various aircraft loadings. PCC and AC pavements have different design criteria and, thus, a different number of equivalent operations of the design aircraft. The critical aircraft operating on the PCC and AC pavements was determined to be the B-737 and the KC-135 aircraft, respectively. Table D1 presents the critical aircraft computation results for the airfield.

The operational ACN values for the critical aircraft operating on the airfield pavements were determined. The critical aircraft is the 68 Mg (150-kip) B-737 for the PCC pavements, and the 137 Mg (302-kip) KC-135 aircraft for the AC pavements. The results showing the ACN values for each pavement type and subgrade strength are shown in Table D2.

In a wartime scenario, aircraft may be required to operate at weights that exceed normal peacetime loads. These aircraft would have a higher ACN, would cause more damage, and reduce the life of the pavement. A mobilization ACN can be determined from the appropriate ACN-PCN curve presented in ETL 1110-3-394 (Headquarters, Department of the Army 1991). Typical ACN-PCN curves for the B-737 and KC-135 aircraft are shown in Figures D1 and D2. For contingency planning, it is often necessary to determine the largest aircraft that can

safely land on an airfield. Runway length is a critical factor in this determination. Minimum take-off distances for maximum take-off weights of aircraft are also given in ETL 1110-3-394 (Headquarters, Department of the Army 1991). For a specified aircraft, the ACN can be determined from the ACN-PCN curve and then the effect of the higher loads on the airfield can be determined from the ACN/PCN ratio. Specific aircraft mobilization traffic requirements are contained in classified mobilization plans and are not included in this report.

ACN-PCN Method of Reporting Pavement Structural Condition

The ACN-PCN method is structured so that the structural evaluation of a pavement for a particular aircraft can be accomplished by using the ratio of the aircraft ACN to the pavement PCN. For a given pavement life and a given number of operations of a particular aircraft, there is a relationship between the ACN/PCN ratio and the percent of pavement life used by the applied traffic. For a given ACN/PCN ratio, a relationship exists for the number of operations that will produce failure of the pavement. These relationships provide a method for evaluating a pavement for allowable load depending on an acceptable degree of damage to the pavement or an allowable number of operations of a particular aircraft to cause failure of a pavement. For aircraft having an ACN equal to the PCN, the predicted failure of the pavement would equal the design life of the pavement. Aircraft having ACN's higher than the pavement PCN would overload the pavement and decrease the life of the pavement. Likewise if the ACN of the operational aircraft were less than the pavement PCN, the life of the pavement would be greater than the design life. If the operational ACN is greater than the pavement PCN and a decrease in pavement life is not acceptable, then structural improvement of the pavement is required to bring the pavement PCN up to or greater than the operational ACN.

PCN Analysis

Modulus values shown in Appendix B were input into the computerized Layered Elastic Evaluation Program (LEEP) to determine the load-carrying capacity of each pavement feature in accordance with UFC 3-260-03 (Headquarters, Departments of the Army, Navy, and the Air Force 2001). Using the design aircraft and traffic levels for normal operations, a PCN was determined for each pavement feature. The PCN is determined using the allowable gross aircraft load and the subgrade strength category. To determine the subgrade category, back-calculated subgrade moduli were converted to CBR values using the correlation $E = 1500 (\text{CBR})$. Table D3 presents a summary of the evaluation of each pavement feature in terms of allowable gross aircraft loadings, PCN, and overlay thicknesses required to increase the structural capacity such that the mission traffic can be supported ($\text{PCN} \geq \text{operational ACN}$). The Airfield Pavement Evaluation Chart (APEC) presented in Illustration 1 shows a layout of the airfield pavements and corresponding PCN for each facility.

The PCN codes and PCI for each feature were analyzed to establish ISR ratings listed in Table 3-1. An ISR Rating for each pavement facility is shown in Illustration 2. AR 420-72 (Headquarters Department of the Army 2000) requires that the following ACN/PCN ratios be used in determining ISR ratings for air-field pavement facilities.

- ACN/PCN \leq 1.0 equals an ISR Green rating
- 1.0 < ACN/PCN \leq 1.5 equals an ISR Amber rating
- ACN/PCN > 1.5 equals an ISR Red rating

For those features having a PCN < the required operational ACN, the additional pavement thickness (overlay) needed to support the mission traffic was computed. Although the required increase in pavement strength is presented as an overlay thickness, several other approaches could be considered. A detailed analysis will be required to select and design the most cost-effective repair or improvement alternative. It should be noted that although less than 102 mm (4-in.) -thick AC overlay requirements are indicated in Table D3, the following minimum thicknesses are recommended in UFC 3-260-2 (Headquarters, Departments of the Army, Navy, and the Air Force 2001):

- a. 51 mm (2-in.) -thick minimum AC overlay over AC pavements.
- b. 102 mm (4-in.) -thick minimum AC overlay over PCC pavements.
- c. 152 mm (6-in.) -thick minimum PCC partially or nonbonded overlay.
- d. 51 mm (2-in.) -thick minimum PCC fully bonded overlay over PCC pavements.

These minimum overlay requirements are required to control the degree of cracking which will occur in the base pavement (existing pavement) due to the application of the design traffic. If those features needing structural improvements are not upgraded in a timely manner pavement may deteriorate rapidly and result in damage to all pavement layers and an increase in cost for the necessary improvements. Excessive damage may also result in lengthy closures of the pavement facility.

The PCN codes for the weakest feature within each pavement facility are shown in Table D5. The PCN code includes the PCN numerical value, pavement type, subgrade category, allowable tire pressure, and method used to determine the PCN. An example of a PCN code is: 30/F/A/W/T, with 30 expressing the numerical PCN value, F indicating a flexible pavement, A indicating high strength subgrade, W indicating high-allowable tire pressure, and T indicating that the PCN value was obtained by a technical evaluation. Table D5 presents a description of the letter codes comprising the PCN code. Each PCN assumes that only the design aircraft will be used for the stated number of passes. Theoretically, if the PCN is equal to the ACN, the pavement should perform satisfactorily and require only routine maintenance through the length of the analysis period. There may be situations when it is necessary to overload a pavement, i.e., the ACN is greater than the PCN. Examples are emergency landings, short-term contingencies, exercises, and air shows. Pavements can usually support some

overload; however, pavement life can be reduced. If the PCN were less than the ACN, the ACN/PCN ratio would be greater than 1 and the pavement would be expected to fail before reaching the end of the analysis period. As a general rule, ACN/PCN ratios of up to 1.25 have minimal impact on pavement life. If the ACN/PCN ratio is between 1.25 and 1.50, aircraft operations should be limited to 10 passes and the pavement inspected after each operation. Aircraft operations resulting in an ACN/PCN ratio over 1.50 should not be allowed except for emergencies. An example of how to use the ACP/PCN method to determine if an aircraft will overload a pavement is shown below.

Example Problem

Runway 9-27, taxiway A, taxiways G and, the East Parking Apron and the Alert Apron must be used for 1,000 passes of a KC-135 aircraft operating at a take-off weight of 136,803 kg (301,600 lb). Find the weakest features on each facility and determine if they can support this traffic?

Solution

From Table D3, determine the PCN for the weakest feature on R/W 9-27, and for taxiways A and G, the East Parking Apron, and for the Alert Apron; from Figure D1 determine the ACN of a 68 Mg (150-kip) B-737, and then calculate the ACN/PCN ratio using the appropriate PCN from Table D3.

a. Runway 9-27.

Weakest feature is R1A (see Table D3)

PCN for R1A = 97/R/B/W/T

ACN for a 68 Mg (150-kip) B-737 on a medium strength subgrade = 45/R/B/W/T (see Figure D2).

ACN/PCN ratio is 45/97 or 0.46; therefore R/W 9-27 should perform satisfactorily.

b. Taxiway A.

Weakest feature is T11A (see Table D3)

PCN for T11A = 41/R/B/W/T

ACN for a 68 Mg (150-kip) B-737 on a medium strength subgrade = 45/R/B/W/T (see Figure D2).

ACN/PCN ratio is 45/41 or 1.10; therefore the overload on T11A will have minimal impact on the pavement life.

c. East Parking Apron (A10B).

PCN for A10B = 66/R/C/W/T

ACN for a 68 Mg (150-kip) B-737 on a low strength subgrade = 47/R/C/W/T (see Figure D2).

ACN/PCN ratio is 47/66 or 0.71; therefore the apron should perform satisfactorily.

d. Alert Apron (A6B).

PCN for A6B = 44/R/B/W/T

ACN for a 68 Mg (150-kip) B-737 on a medium strength subgrade = 45/R/B/W/T (see Figure D2).

ACN/PCN ratio is 45/44 or 1.02; therefore the overload on A6B will have minimal impact on the pavement life.

A summary of the evaluation of the controlling feature of each pavement facility in terms of PCN for thaw-weakened period (November through April) is shown in Table D4. When a pavement is not properly designed and constructed to withstand the detrimental effects of winter, one or both of the following will occur: nonuniform heave due to ice lenses or loss of strength during the thaw period. Thaw-weakened periods, which generally occur during the time period of November through April, are based on the climatological data shown in Table A1. During this period, several to many cycles of freezing and thawing will occur. Loss of strength will take place during thaw periods in those pavements that have not been properly designed and constructed to prevent such loss. The degree of strength also depends upon the depth of frost and subsequent thawing. The depth of frost penetration 1194 mm (47-in.) was determined from the climatological data summary for FANG. Typical soils in the area are medium susceptible. PCNs for the thaw-weakened periods are provided as guidance to the airfield operator for managing airfield operations during the November through April time frame.

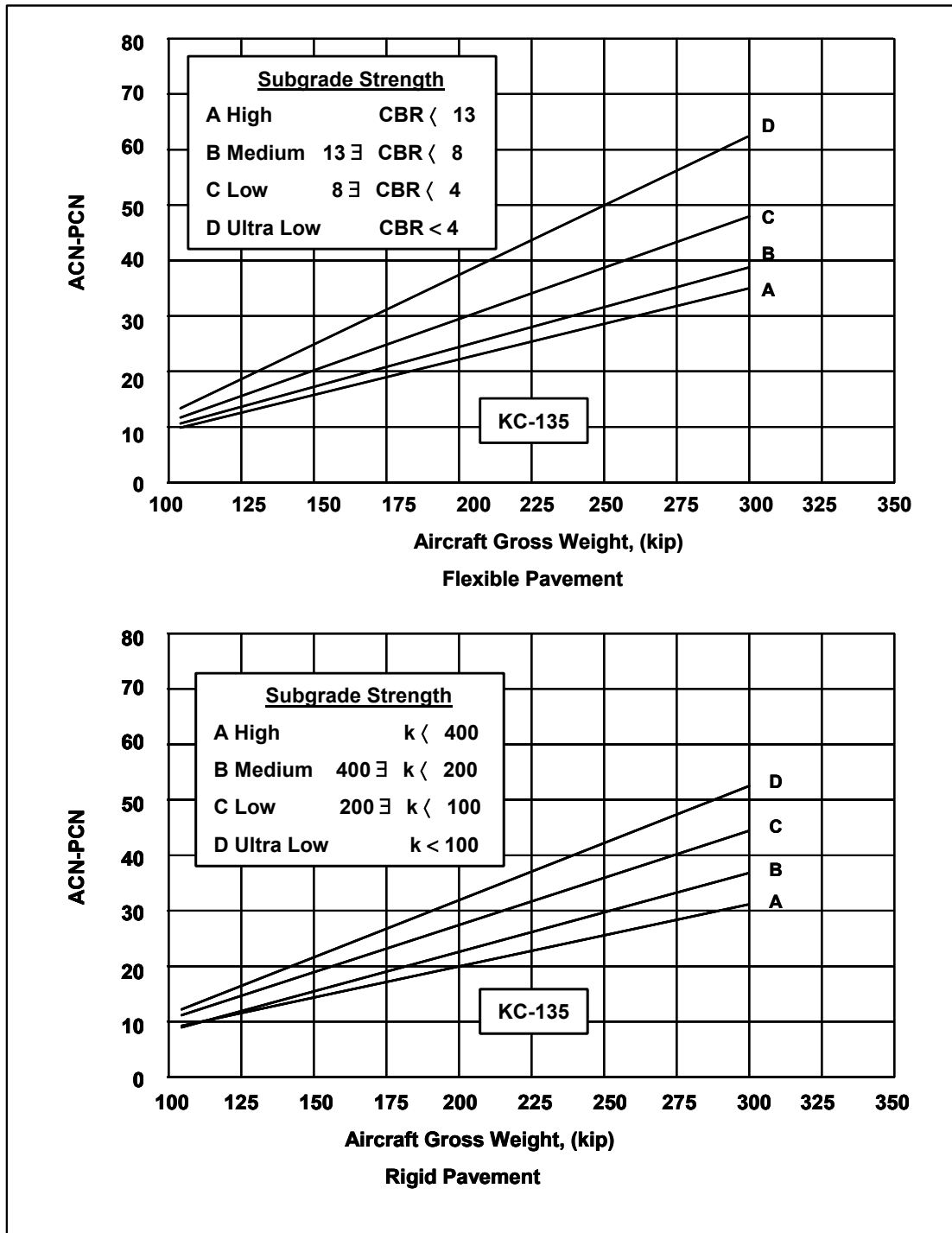


Figure D1. ACN-PCN curve for a KC-135

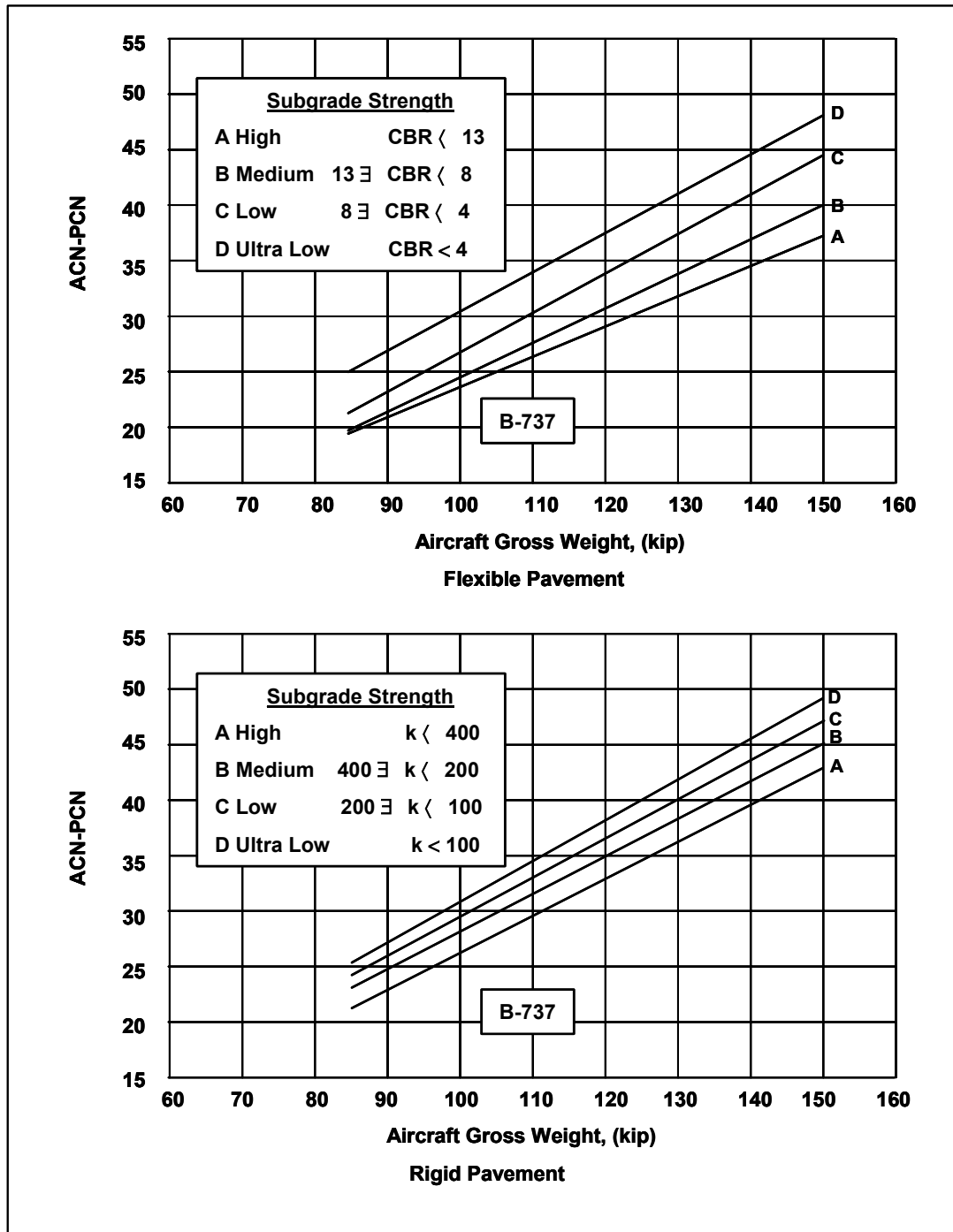


Figure D2. ACN-PCN curve for a B-737

Table D1
Determination of Critical Aircraft and Design Traffic

PCC Pavements			
Fixed-Wing Aircraft	Gross Weight kg (lb)	20-year Projected Aircraft Passes	20-year Equivalent C-17 Passes
B-737	68,040 (150,000)	300	300
B-757	116,120 (256,000)	40	3
C-12	7,530 (16,600)	1140	1
C-130	70,310 (155,000)	5720	82
C-141	146,510 (323,000)	1100	184
C-17	263,080 (580,000)	20	26
C-5	348,810 (769,000)	140	59
C-9	48,990 (108,000)	20	3
BO-28	2,000 (4,400)	20	1
DC-10	265,805 (583,000)	84	37
717	54,885 (121,000)	20	7
E-2	23,540 (51,980)	20	1
F-14	32,930 (72,600)	20	3
F-15	30,840 (68,000)	400	84
F-16	17,000 (37,500)	11700	58
F-18	29,940 (66,000)	3900	202
KC-135	13,680 (301,600)	3640	267
L1011	225,900 (498,000)	100	76
T-2	6,685 (14,737)	20	1
T-37	2,990 (6600)	80	1
T-38	5,443 (12,000)	80	1
BO-28	2,000 (4,400)	160	1
20-year Total Equivalent B-737 passes @ 68,040 (256,000) = 1398 use 1400			
AC Pavements			
Fixed-Wing Aircraft	Gross Weight kg (lb)	20-year Projected Aircraft Passes	20-year Equivalent C-17 Passes
B-737	68,040 (150,000)	300	112
B-757	116,120 (256,000)	40	47518
C-12	7,530 (16,600)	1140	1
C-130	70,310 (155,000)	5720	286
C-141	146,510 (323,000)	1100	2767
C-17	263,080 (580,000)	20	229
C-5	348,810 (769,000)	140	637
C-9	48,990 (108,000)	20	1
BO-28	2,000 (4,400)	20	1
DC-10	265,805 (583,000)	84	683
717	54,885 (121,000)	20	2
E-2	23,540 (51,980)	20	1
F-14	32,930 (72,600)	20	1
F-15	30,840 (68,000)	400	10
F-16	17,000 (37,500)	11700	2
F-18	29,940 (66,000)	3900	37
KC-135	13,680 (301,600)	3640	3640
L1011	225,900 (498,000)	100	1091
T-2	6,685 (14,737)	20	1
T-37	2,990 (6600)	80	1
T-38	5,443 (12,000)	80	1
BO-28	2,000 (4,400)	160	1
20-year Total Equivalent KC-135 passes @ 13680 (301,600) = 9523 (use 9525)			

Table D2			
Determination of ACN Values for the Critical Aircraft			
AC Pavements			
Design Aircraft	Weight kg (lb)	Subgrade Category ¹	ACN or Required PCN
KC-135	136,803 (301,600)	A B C D	36 40 49 63
B-737	68,039 (150,000)	A B C D	37 40 44 48
PCC Pavements			
Design Aircraft	Weight kg (lb)	Subgrade Category ¹	ACN or Required PCN
KC-135	136,803 (301,600)	A B C D	31 38 46 52
B-737	68,039 (150,000)	A B C D	43 45 47 49
¹ See Table D5 for subgrade category.			

Table D3
Allowable Gross Aircraft Loads and Overlay Requirements for the Projected Day-To-Day Traffic

Pavement Facility	Feature	Test Number or Station m (ft)	Type Traffic Area	Subgrade Strength ¹ CBR, % or K, kPa/mm (psi/in.)	Design Aircraft ²				Allowable Gross Load Mg (kips)	PCN	Theoretical Overlay Requirements, mm (in.)		
					Aircraft	Weight Kg (lb)	Passes	ACN			AC	Bond	PCC Partial
Fixed-wing Pavements													
Runway 9-27	R1A	0+00-2+74 (0+00-9+00)	A	89 (328)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	97/R/B/W/T	NA	0	0
	R3C	2+74- 4+57 (9+00-15+00)	C	80 (297)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	120/R/B/W/T	NA	0	0
	R5C	4+57-22+25 (15+00-73+00)	C	18	KC-135	136,803 (301,600)	9523	36/F/A/W/T	137 (302+) ³	118/F/A/W/T	0	NA	-- ⁴
	R7C	22+25-24+08 (73+00-79+00)	C	87 (321)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	120/R/B/W/T	NA	0	0
	R9A	24+08-27+45 (79+00-89+00)	A	88 (326)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	105/R/B/W/T	NA	0	0
	T4A	7+39-15+37 (24+25-50+45)	A	18	KC-135	136,803 (301,600)	9523	36/F/A/W/T	137 (302+) ³	61/F/A/W/T	0	NA	-- ⁴
	T6A	15+37-28+43 (50+45-93+27)	A	25	KC-135	136,803 (301,600)	9523	36/F/A/W/T	137 (302+) ³	45/F/A/W/T	0	NA	-- ⁴
Taxiway A	T11A	28+43-30+62 (93+27-100+47)	A	61 (225)	B-737	68,039 (150,000)	1398	45/R/B/W/T	63 (138)	41/R/B/W/T	NA	130 (5.1)	173 (6.8)
	T15A	0+00-1+37 (0+00-1+50)	A	73 (271)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	91/R/B/W/T	NA	0	0
	T19A	30+62-30+98 (100+47-101+67)	A	89 (327)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	97/R/B/W/T	NA	0	0
	T21A	1+37-7+39 (1+50-24+25)	A	78 (289)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	67/R/B/W/T	NA	0	0
	T25A	2+06-2+30 (6+77-7+55)	A	115 (424)	B-737	68,039 (150,000)	1398	43/R/A/W/T	68 (150+) ³	74/R/A/W/T	NA	0	0
(Sheet 1 of 3)													

¹ Values based on correlations between CBR and/or k and the backcalculated subgrade modulus.

² Determined for the critical aircraft (see Table D1).

³ The allowable gross load is greater than the maximum take-off weight of the critical aircraft.

⁴ Was not calculated because feature was evaluated as a flexible pavement.

Table D3 (Continued)

Pavement Facility	Feature	Test Number or Station m (ft)	Type Traffic Area	Subgrade Strength ¹ CBR, % or K, kPa/mm (psi/in.)	Design Aircraft ²				Allowable Gross Load Mg (kips)	PCN	Theoretical Overlay Requirements, mm (in.)			
					Aircraft	Weight Kg (lb)	Passes	ACN			AC	Bond	PCC Partial	PCC No Bond
Fixed-wing Pavements														
Taxiway B	T9C	0+83-2+25 (2+75-7+37)	C	23	KC-135	136,803 (301,600)	9523	36/F/A/W/T	137 (302+) ³	43/F/A/W/T	0	NA	-- ⁴	
	T18C	0+00-0+70 (0+00-2+00)	C	99 (364)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	120/R/B/W/T	NA	0	0	
	T20C	0+70-0+83 (2+00-2+75)	C	83	KC-135	136,803 (301,600)	9523	36/F/A/W/T	137 (302+) ³	120/F/A/W/T	NA	NA	NA	-- ⁴
Taxiway C	T17C	0+00-0+61 (0+00-2+00)	C	126 (465)	B-737	68,039 (150,000)	1398	43/R/A/W/T	68 (150+) ³	154/R/A/W/T	NA	0	0	
	T24C	0+61-2+21 (2+00-7+24)	C	96 (354)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	107/R/B/W/T	NA	0	0	
Taxiway D	T3C	0+78-1+51 (2+55-4+95)	C	27	KC-135	136,803 (301,600)	9523	36/F/A/W/T	130 (285)	83/F/A/W/T	0	NA	-- ⁴	
	T16C	0+00-0+78 (0+00-2+55)	C	13	KC-135	136,803 (301,600)	9523	40/F/B/W/T	137 (302+) ³	77/F/B/W/T	0	NA	-- ⁴	
Taxiway E	T22C	0+00-3+11 (0+00-10+20)	C	72 (267)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	96/R/B/W/T	NA	0	0	
Taxiway F	T23C	0+00-2+23 (0+00-7+30)	C	61 (226)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	90/R/B/W/T	NA	0	0	
Taxiway G	T7B	0+00-1+83 (0+00-6+00)	B	18	KC-135	136,803 (301,600)	9523	36/F/A/W/T	78 (171)	19/F/A/W/T	119 (4.7)	NA	-- ⁴	
Trim Pad Access	T14B	0+00-0+88 (0+00-2+90)	B	26	KC-135	136,803 (301,600)	9523	36/F/A/W/T	104 (230)	27/F/A/W/T	61 (2.4)	NA	-- ⁴	
West Arm/Disarm Apron	A1B	1-4	B	44 (164)	B-737	68,039 (150,000)	1398	47/R/C/W/T	60 (134)	42/R/C/W/T	NA	76 (2.9)	135 (5.1)	
Hangar 504 Apron	A3C	1-2	C	41 (148)	B-737	68,039 (150,000)	1398	47/R/C/W/T	68 (150+) ³	56/R/C/W/T	NA	0	0	
Parking Apron North	A5B ⁵	1-8	B	13	KC-135	136,803 (301,600)	9523	36/F/A/W/T	137 (302+) ³	71/F/A/W/T	NA	NA	-- ⁴	
	A12B ⁵	1-8	B	17	KC-135	136,803 (301,600)	9523	36/F/A/W/T	137 (302+) ³	62/F/A/W/T	0	NA	-- ⁴	
(Sheet 2 of 3)														

¹ Values based on correlations between CBR and/or k and the backcalculated subgrade modulus.

² Determined for the critical aircraft (see Table D1).

³ The allowable gross load is greater than the maximum take-off weight of the critical aircraft.

⁴ Was not calculated because feature was evaluated as a flexible pavement.

⁵ Composite pavement evaluated as a flexible pavement.

(Sheet 2 of 3)

Table D3 (Concluded)													
Pavement Facility	Feature	Test Number or Station m (ft)	Type Traffic Area	Subgrade Strength ¹ CBR, % or K, kPa/mm (psi/in.)	Design Aircraft ²			Allowable Gross Load Mg (kips)	PCN	Theoretical Overlay Requirements, mm (in.)			
					Aircraft	Weight Kg (lb)	Passes			ACN	AC	PCC	
												PCC Partial	PCC No Bond
Fixed-wing Pavements													
Alert Apron	A6B	1-3	B	81 (299)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	45/R/B/W/T	NA	0	0
East Arm/Disarm Apron	A7B	1-4	B	60 (220)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	45/R/B/W/T	NA	0	0
Trim Pad	A8B	1	B	92 (340)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	50/R/B/W/T	NA	0	0
Hangar 932 Apron	A14B	1	B	53 (196)	B-737	68,039 (150,000)	1398	47/R/L/W/T	24 (53)	13/R/C/W/T	NA	272 (10.7)	307 (12.1)
	A9C	1-3	C	87 (320)	B-737	68,039 (150,000)	1398	45/R/B/W/T	68 (150+) ³	80/R/B/W/T	NA	0	0
Parking Apron East	A10B	1-12	B	39 (144)	B-737	68,039 (150,000)	1398	47/R/C/W/T	68 (150+) ³	66/R/C/W/T	NA	0	0
Hot Fuel Pad	A11D	1-4	D	32 (120)	B-737	68,039 (150,000)	1398	47/R/C/W/T	28 (61)	16/R/C/W/T	NA	224 (8.8)	267 (10.5)
Parking Apron West	A13B	1-8	B	54 (199)	B-737	68,039 (150,000)	1398	47/R/C/W/T	68 (150+) ³	66/R/C/W/T	NA	0	0
(Sheet 3 of 3)													

1

2

3

4

Values based on correlations between CBR and/or k and the backcalculated subgrade modulus.

Determined for the critical aircraft (see Table D1).

The allowable gross load is greater than the maximum take-off weight of the critical aircraft.

Was not calculated because feature was evaluated as a flexible pavement

¹ Values based on correlations between CBR and/or k and the backcalculated subgrade modulus.

² Determined for the critical aircraft (see Table D1).

³ The allowable gross load is greater than the maximum take-off weight of the critical aircraft.

⁴ Was not calculated because feature was evaluated as a flexible pavement.

Table D4 Allowable Gross Aircraft Loads and Overlay Requirements for the Projected Day-To-Day Traffic during the Frost Period November through April										
Pavement Facility	Feature	Test Number or Station m (ft)	Type Traffic Area	Subgrade Frost Code	Operational ¹ ACN ²	Allowable Gross Load Mg (kips)	PCN	Theoretical Overlay Requirements, mm (in.)		
								AC	Bond	PCC No Bond
Fixed-wing Pavements										
Runway 9-27	R1A	0+00-2+74 (0+00-9+00)	A	F2	49/R/DW/T	68 (150+) ³	67/R/DW/T	0	0	0
	R3C	2+74- 4+57 (9+00-15+00)	C	F2	49/R/DW/T	68 (150+) ³	97/R/DW/T	0	0	0
	R5C	4+57-22+25 (15+00-73+00)	C	F2	36/F/AW/T	137 (302+) ³	116/F/AW/T	0	NA	-- ⁴
	R7C	22+25-24+08 (73+00-79+00)	C	F2	49/R/DW/T	68 (150+) ³	97/R/DW/T	0	0	0
	R9A	24+08-27+45 (79+00-89+00)	A	F2	49/R/DW/T	68 (150+) ³	72/R/CW/T	0	0	0
Taxiway A	T4A	7+39-15+37 (24+25-50+45)	A	F2	49/F/CW/T	93 (204)	30/F/CW/T	99 (3.9)	NA	-- ⁴
	T6A	15+37-28+43 (50+45-93+27)	A	F2	49/F/CW/T	65 (143)	19/F/CW/T	196 (7.7)	NA	-- ⁴
	T11A	28+43-30+62 (93+27- 100+47)	A	F2	49/R/DW/T	42 (92)	28/R/DW/T	206 (8.1)	175 (6.9)	224 (8.8)
	T15A	0+00-1+37 (0+00-1+50)	A	F2	49/R/DW/T	68 (150+) ³	66/R/DW/T	0	0	0
	T19A	30+62-30+98 (100+47- 101+67)	A	F2	49/R/DW/T	68 (150+) ³	67/R/DW/T	0	0	0
	T21A	1+37-7+39 (1+50-24+25)	A	F2	49/R/DW/T	68 (150+) ³	46R/DW/T	0	0	0
	T25A	2+06-2+30 (6+77-7+55)	A	F2	49/R/DW/T	68 (150+) ³	48/R/DW/T	0	0	0
(Sheet 1 of 3)										
¹ Values based on correlations between CBR and/or k and the backcalculated subgrade modulus. ² Determined for the critical aircraft (see Table D1). ³ The allowable gross load is greater than the maximum take-off weight of the critical aircraft. ⁴ Was not calculated because feature was evaluated as a flexible pavement.										

Table D4 (Continued)

Table D4 (Concluded)										
Pavement Facility	Feature	Test Number or Station m (ft)	Type Traffic Area	Subgrade Frost Code	Operational ¹ ACN ²	Allowable Gross Load Mg (kips)	PCN	Theoretical Overlay Requirements, mm (in.)		
								AC	Bond	PCC No Bond
Fixed-wing Pavements										
Alert Apron	A6B	1-3	B	F2	45/R/B/W/T	63 (139)	25/R/D/W/T	0 (0)	41 (1.6)	81 (3.2)
East Arm/Disarm Apron	A7B	1-4	B	F2	49/R/D/W/T	43 (95)	29/R/D/W/T	0	114 (4.2)	171 (6.7)
	A8B	1	B	F2	49/R/D/W/T	45 (99)	31/R/D/W/T	13 (0.5)	152 (6.0)	198 (7.8)
Trim Pad	A14B	1	B	F2	49/R/D/W/T	45 (99)	31/R/D/W/T	348 (13.7)	211 (8.3)	239 (9.4)
	A9C	1-3	C	F2	49/R/D/W/T	68 (150+) ³	48/R/C/W/T	0	0	0
Hangar 932 Apron	A10B	1-12	B	F2	49/R/D/W/T	68 (150+) ³	45/R/C/W/T	0	0	0
Parking Apron East	A11D	1-4	D	F2	49/R/D/W/T	19 (42)	10/R/D/W/T	292 (11.5)	241 (9.5)	284 (11.2)
Parking Apron West	A13B	1-8	B	F2	49/R/D/W/T	66 (145)	47/R/D/W/T	0	0	0
(Sheet 3 of 3)										
¹ Values based on correlations between CBR and/or k and the backcalculated subgrade modulus.										
² Determined for the critical aircraft (see Table D1).										
³ The allowable gross load is greater than the maximum take-off weight of the critical aircraft.										
⁴ Was not calculated because feature was evaluated as a flexible pavement.										

Table D4
Summary of Pavement Classification Numbers

Pavement Facility	Controlling Feature	PCN ¹ Code, Normal Nonfrost	PCN ¹ Code, Thaw-weakening
Runway 9-27	R1A	97/R/B/W/T	67/R/D/W/T
Taxiway A	T11A	41/R/B/W/T	28/R/D/W/T
Taxiway B	T9C	43/F/A/W/T	17/F/C/W/T
Taxiway C	T24C	107/R/B/W/T	69/R/D/W/T
Taxiway D	T16C	77/F/B/W/T	47/F/C/W/T
Taxiway E	T22C	96/R/B/W/T	67/R/D/W/T
Taxiway F	T23C	90/R/B/W/T	64/R/D/W/T
Taxiway G	T7B	19/F/A/W/T	5/F/C/W/T
Trim Pad Access	T14B	27/F/A/W/T	6/F/C/W/T
West Arm/Disarm Apron	A1B	42/R/C/W/T	28/R/D/W/T
Hangar 504 Apron	A3C	56/R/C/W/T	39/R/D/W/T
Parking Apron North	A12B	62/F/A/W/T	36/F/C/W/T
Alert Apron	A6B	44/R/B/W/T	25/R/D/W/T
East Arm/Disarm Apron	A7B	45/R/B/W/T	29/R/D/W/T
Trim Pad	A14B	13/R/C/W/T	31/R/D/W/T
Hangar 932 Apron	A9C	80/R/B/W/T	48/R/D/W/T
Parking Apron East	A10B	66/R/C/W/T	45/R/D/W/T
Hot Fuel Pad	A11D	16/R/C/W/T	10/R/D/W/T
Parking Apron West	A13B	66/R/C/W/T	47/R/D/W/T
¹ Table D5 describes the components of the PCN code.			

Table D5
PCN Five-Part Code

PCN	Pavement Type	Subgrade Strength ¹	Tire Pressure ²	Method of PCN Determination
Numerical value	R - rigid	A	W	T - technical evaluation
	F - flexible	B	X	U - using aircraft
		C	Y	
		D	Z	
<u>¹Code</u>	<u>Category</u>	<u>Flexible Pavement CBR, %</u>	<u>Rigid Pavement K, kPa/mm, (psi/in.)</u>	
A	High	< 13	< 108 (400)	
B	Medium	13 > CBR < 8	108 > K < 54 (400 > K < 200)	
C	Low	8 > CBR < 4	54 > K < 27 (200 > K < 100)	
D	Ultra-low	< 4	< 27 (< 100)	
<u>²Code</u>	<u>Category</u>	<u>Tire Pressure, MPa (psi)</u>		
W	High	No limit		
X	Medium	1.0 - 1.5 (146 - 217)		
Y	Low	0.51 - 1.0 (73 - 145)		
Z	Ultra-low	0 - 0.5 (0 - 72)		

Appendix E

Micro PAVER Output Summary

```

Network ID      - Volk
Branch Name     - RUNWAY 09-27 (West Keel)   Slab Length    -    20.00 LF
Branch Number   - R1A                       Slab Width     -    18.75 LF
Section Number  - 1      Family - DEFAULT    Number of Slabs -    248
=====

```

```

-----
Inspection Date: 07/30/2002
Riding Quality :           Safety:           Drainage Cond.:
Shoulder Cond. :           Overall Cond.:           F.O.D.:
-----

```

```

PCI OF SECTION = 100                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS = 13
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 10
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 0.1635%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
66 SMALL PATCH	LOW	1 (SLABS)	1.0	0.15

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	100.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - RUNWAY 09-27 (West Keel)  Slab Length      -      20.00 LF
Branch Number   - R2D                      Slab Width        -      18.75 LF
Section Number  - 1      Family - DEFAULT    Number of Slabs   -      150
=====

```

```

-----
Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :                      Overall Cond.: F.O.D.:
-----

```

```

PCI OF SECTION = 98                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS = 7
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 6
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 2.939%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
66 SMALL PATCH	LOW	1 (SLABS)	1.0	0.15
74 JOINT SPALL	LOW	1 (SLABS)	1.0	0.60
75 CORNER SPALL	LOW	1 (SLABS)	4.6	1.69

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD          RELATED DISTRESSES =      .00 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES =      .00 PERCENT DEDUCT VALUES.
OTHER         RELATED DISTRESSES = 100.00 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - RUNWAY 09-27          Slab Length     -    20.00 LF
Branch Number   - R3C                   Slab Width      -    18.75 LF
Section Number  - 1      Family - DEFAULT Number of Slabs -    120
=====

```

```

-----
Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

```

```

PCI OF SECTION = 100                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS = 6
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 5
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 0.4930%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
66 SMALL PATCH	LOW	2 (SLABS)	2.0	0.43

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	100.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - RUNWAY 09-27
Branch Number   - R4D
Section Number  - 1      Family - DEFAULT
Slab Length     - 20.00 LF
Slab Width      - 18.75 LF
Number of Slabs - 120
=====

```

```

-----
Inspection Date: 07/30/2002
Riding Quality :      Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

```

```

PCI OF SECTION = 99                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS = 6
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 5
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 2.578%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
66 SMALL PATCH	LOW	1 (SLABS)	1.0	0.15
74 JOINT SPALL	LOW	1 (SLABS)	1.0	0.60
75 CORNER SPALL	LOW	1 (SLABS)	2.0	0.84

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD          RELATED DISTRESSES = .0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = .0 PERCENT DEDUCT VALUES.
OTHER         RELATED DISTRESSES = 100.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - RUNWAY 09-27
Branch Number   - R5C
Section Number  - 1      Family - DEFAULT
Section Length  -      5,800.00 LF
Section Width   -      75.00 LF
Section Area    - 435,000.00 SF
=====

```

```

-----
Inspection Date: 07/30/2002
Riding Quality :           Safety:           Drainage Cond.:
Shoulder Cond. :           Overall Cond.:           F.O.D.:
-----

```

```

PCI OF SECTION = 100                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS = 77
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 13
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 0%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
---------------	----------	----------	-----------	--------------

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	.00 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	.00 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	.00 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - RUNWAY 09-27
Branch Number   - R6D
Section Number  - 1      Family - DEFAULT
Section Length  - 11,600.00 LF
Section Width   - 37.50 LF
Section Area    - 435,000.00 SF
=====

```

```

-----
Inspection Date: 07/30/2002
Riding Quality :          Safety:          Drainage Cond.:
Shoulder Cond. :          Overall Cond.:      F.O.D.:
-----

```

```

PCI OF SECTION = 99                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS = 78
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 13
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 4.434%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
48 L & T CR	LOW	178 (LF)	0.10	2.50
50 PATCHING	LOW	1427 (SF)	0.33	2.16

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	100.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - RUNWAY 09-27          Slab Length    - 20.00 LF
Branch Number   - R7C                   Slab Width     - 18.75 LF
Section Number  - 1      Family - DEFAULT Number of Slabs - 180
=====

-----
Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :                      Overall Cond.: F.O.D.:
-----

PCI OF SECTION = 100                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS = 10
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 8
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 0.8066%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE    SEVERITY      QUANTITY      DENSITY %    DEDUCT VALUE
74 JOINT SPALL    LOW              1 (SLABS)      1.0          0.6

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD              RELATED DISTRESSES = .0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = .0 PERCENT DEDUCT VALUES.
OTHER              RELATED DISTRESSES = 100.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - RUNWAY 09-27          Slab Length     -    20.00 LF
Branch Number   - R8D                   Slab Width      -    18.75 LF
Section Number  - 1      Family - DEFAULT Number of Slabs -    60
=====

```

```

-----
Inspection Date: 07/30/2002
Riding Quality :           Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

```

```

PCI OF SECTION = 99                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS = 3
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 3
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 3 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 1.158%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
74 JOINT SPALL	LOW	1 (SLABS)	1.67	1.36
75 CORNER SPALL	LOW	1 (SLABS)	1.67	0.73

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	.00 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	.00 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	100.00 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - RUNWAY 09-27          Slab Length     -      20.00 LF
Branch Number   - R9A                   Slab Width      -      18.75 LF
Section Number  - 1      Family - DEFAULT Number of Slabs -      266
=====

```

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-----
Inspection Date: 07/30/2002
Riding Quality :           Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

```

```

PCI OF SECTION = 99                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS = 14
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 10
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 1.487%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
66 SMALL PATCH	LOW	1 (SLABS)	1.00	0.15
74 JOINT SPALL	MEDIUM	1 (SLABS)	1.00	1.00

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	100.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - RUNWAY 09-27          Slab Length    -    20.00 LF
Branch Number   - R10D                  Slab Width     -    18.75 LF
Section Number  - 1      Family - DEFAULT Number of Slabs -    134
=====

```

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-----
Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :          Overall Cond.:      F.O.D.:
-----

```

```

PCI OF SECTION = 99                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS = 7
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 6
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 2.261%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
74 JOINT SPALL	MEDIUM	2 (SLABS)	1.67	2.33

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	100.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - TAXIWAY D (SOUTH END)      Section Length - 240.00 LF
Branch Number   - T3C                        Section Width  - 75.00 LF
Section Number  - 1      Family - DEFAULT     Section Area   - 18,000.00 SF
=====

```

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-----
Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

```

```

PCI OF SECTION = 53                                RATING = FAIR

```

```

TOTAL NUMBER OF SAMPLE UNITS = 2
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 2
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 2 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 10%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
43 BLOCK CR	LOW	900 (SF)	5.00	13.58
45 DEPRESSION	LOW	9 (SF)	0.10	0.30
45 DEPRESSION	MEDIUM	385 (SF)	2.14	22.42
48 L & T CR	LOW	1351 (LF)	7.50	19.52
48 L & T CR	MEDIUM	56 (LF)	0.31	6.60
52 WEATH/RAVEL	LOW	9901 (SF)	55.01	21.04
53 RUTTING	LOW	180 (SF)	1.00	15.32
53 RUTTING	MEDIUM	41 (SF)	0.23	16.14

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	27.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	53.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	20.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - TAXIWAY A (CENTER)      Section Length  - 2,620.00 LF
Branch Number   - T4A                    Section Width   - 75.00 LF
Section Number  - 1      Family - DEFAULT Section Area   - 196,500.00 SF
=====

```

```

-----
Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

```

```

PCI OF SECTION = 63                                RATING = GOOD

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```

TOTAL NUMBER OF SAMPLE UNITS = 35
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 12
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 2.637%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
43 BLOCK CR	LOW	6545 (SF)	3.33	11.37
48 L & T CR	HIGH	195 (LF)	0.10	7.50
48 L & T CR	LOW	23,219 (LF)	11.32	25.55
52 WEATH/RAVEL	LOW	196,500 (SF)	100.00	26.34

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD          RELATED DISTRESSES = .0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = 100.0 PERCENT DEDUCT VALUES.
OTHER         RELATED DISTRESSES = .0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY A
Branch Number   - T6A
Section Number  - 1    Family - DEFAULT
Section Length  -      4,791.00 LF
Section Width   -      75.00 LF
Section Area    -    321,825.00 SF
=====

-----
Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

PCI OF SECTION = 47                                RATING = FAIR

TOTAL NUMBER OF SAMPLE UNITS = 58
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 13
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 3.914%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE      SEVERITY      QUANTITY      DENSITY %      DEDUCT VALUE

41 ALLIGATOR CR      LOW      21,130 (SF)      6.58      38.94
43 BLOCK CR          LOW      284,207 (SF)     88.31      34.20
45 DEPRESSION        LOW      528 (SF)         0.16      0.52
45 DEPRESSION        MEDIUM    352 (SF)         0.11      5.19
48 L & T CR          LOW      440 (LF)         0.14      2.62
50 PATCHING          LOW      7,915 (SF)       2.46      6.36

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD      RELATED DISTRESSES = 44.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = 50.0 PERCENT DEDUCT VALUES.
OTHER     RELATED DISTRESSES = 6.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY G
Branch Number   - T7B
Section Number  - 1    Family - DEFAULT
Section Length  -      600.00 LF
Section Width   -      75.00 LF
Section Area    -    45,000.00 SF
=====

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Inspection Date: 07/30/2002
Riding Quality :           Safety:           Drainage Cond.:
Shoulder Cond. :           Overall Cond.:           F.O.D.:
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PCI OF SECTION = 38                                RATING = POOR

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```

TOTAL NUMBER OF SAMPLE UNITS = 8
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 7
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 4.6%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
41 ALLIGATOR CR	LOW	119 (SF)	0.26	10.02
41 ALLIGATOR CR	MEDIUM	697 (SF)	1.55	33.60
43 BLOCK CR	MEDIUM	44,535 (SF)	98.97	52.80
50 PATCHING	LOW	600 (SF)	1.33	4.26
50 PATCHING	MEDIUM	103 (SF)	0.23	7.32

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD          RELATED DISTRESSES = 40.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = 60.0 PERCENT DEDUCT VALUES.
OTHER         RELATED DISTRESSES = 0.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY B (SOUTH END)   Section Length - 507.00 LF
Branch Number   - T9C                   Section Width  - 75.00 LF
Section Number  - 1      Family - DEFAULT Section Area   - 33,750.00 SF
=====

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-----
Inspection Date: 07/30/2002
Riding Quality :           Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

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PCI OF SECTION = 100                                RATING = EXCELLENT

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```

TOTAL NUMBER OF SAMPLE UNITS = 5
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 5
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 0%

```

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*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

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DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
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*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.

Inspection Date: 07/30/2002
Riding Quality : Safety: Drainage Cond.:
Shoulder Cond. : Overall Cond.: F.O.D.:

TOTAL NUMBER OF SAMPLE UNITS = 13
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 9
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 7 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 9.831%

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
62 CORNER BREAK	LOW	1 (SLABS)	1.00	0.70
63 LINEAR CR	LOW	1 (SLABS)	1.00	1.00
64 DURABIL. CR	MEDIUM	1 (SLABS)	1.00	1.00
65 JT SEAL DMG	LOW	64 (SLABS)	21.15	2.00
66 SMALL PATCH	LOW	162 (SLABS)	53.85	7.21
66 SMALL PATCH	MEDIUM	1 (SLABS)	1.00	0.60
67 LARGE PATCH	LOW	36 (SLABS)	12.02	6.82
67 LARGE PATCH	MEDIUM	3 (SLABS)	1.00	2.50
73 SHRINKAGE CR	LOW	1 (SLABS)	1.00	0.60
74 JOINT SPALL	LOW	4 (SLABS)	1.44	1.22
75 CORNER SPALL	LOW	7 (SLABS)	2.40	0.96

LOAD	RELATED DISTRESSES =	7.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	12.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	81.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - TRIM PAD ACCESS
Branch Number   - T14B
Section Number  - 1      Family - DEFAULT
Section Length  -      290.00 LF
Section Width   -      50.00 LF
Section Area    -    14,500.00 SF
=====

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-----
Inspection Date: 07/30/2002
Riding Quality :           Safety:           Drainage Cond.:
Shoulder Cond. :           Overall Cond.:           F.O.D.:
-----

```

```

PCI OF SECTION = 35                                RATING = POOR

```

```

TOTAL NUMBER OF SAMPLE UNITS = 3
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 3
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 3 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 13.91%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
41 ALLIGATOR CR	LOW	205 (SF)	1.37	23.41
43 BLOCK CR	HIGH	2,498 (SF)	17.23	48.21
43 BLOCK CR	MEDIUM	11,992 (SF)	82.70	49.32
45 DEPRESSION	LOW	6 (SF)	0.10	0.30
45 DEPRESSION	MEDIUM	48 (SF)	0.33	8.24

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD          RELATED DISTRESSES = 18.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = 75.0 PERCENT DEDUCT VALUES.
OTHER         RELATED DISTRESSES = 7.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY A (WEST END)      Slab Length    -   20.00 LF
Branch Number   - T15A                      Slab Width     -   18.75 LF
Section Number  - 1      Family - DEFAULT    Number of Slabs -    70
=====

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-----
Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

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```

PCI OF SECTION = 100                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS = 4
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 4
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 4 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 0%

```

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*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

```

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
---------------	----------	----------	-----------	--------------

```

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - TAXIWAY A (WEST END)      Section Length  -    255.00 LF
Branch Number   - T16C                      Section Width   -     75.00 LF
Section Number  - 1      Family - DEFAULT    Section Area    -   19,125.00 SF
=====

```

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-----
Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :                      Overall Cond.: F.O.D.:
-----

```

```

PCI OF SECTION =    100                                RATING = EXCELLENT

```

```

TOTAL NUMBER OF SAMPLE UNITS =    2
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =    2
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =    0
RECOMMENDED MINIMUM OF    3  RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED =    0%

```

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

```

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
---------------	----------	----------	-----------	--------------

```

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - TAXIWAY C (NORTH END)      Slab Length    -    25.00 LF
Branch Number  - T17C                        Slab Width     -    25.00 LF
Section Number - 1      Family - DEFAULT      Number of Slabs -    63
=====

-----
Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :                      Overall Cond.: F.O.D.:
-----

PCI OF SECTION =   100                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS =   3
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =   3
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =   0
RECOMMENDED MINIMUM OF   4  RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED =   0%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE      SEVERITY          QUANTITY          DENSITY %      DEDUCT VALUE

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD                RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY  RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.
OTHER               RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY B (NORTH END)   Slab Length    -    20.00  LF
Branch Number   - T18C                   Slab Width     -    18.75  LF
Section Number  - 1      Family - DEFAULT  Number of Slabs -    64
=====

-----
Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

PCI OF SECTION =   96                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS = 4
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      = 4
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 4 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 4.782%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE    SEVERITY      QUANTITY      DENSITY %    DEDUCT VALUE
74 JOINT SPALL    LOW              9 (SLABS)      14.06         4.55

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD              RELATED DISTRESSES =    0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES =    0.0 PERCENT DEDUCT VALUES.
OTHER              RELATED DISTRESSES =  100.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY A (EAST END)      Slab Length    -    20.00 LF
Branch Number   - T19A                      Slab Width     -    20.00 LF
Section Number  - 1      Family - DEFAULT    Number of Slabs -    42
=====

-----
Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

PCI OF SECTION =   100                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS =   3
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =   3
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =   0
RECOMMENDED MINIMUM OF 3 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED =   0%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE      SEVERITY          QUANTITY          DENSITY %      DEDUCT VALUE

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD                RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY  RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.
OTHER               RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY B (CENTER)
Branch Number   - T20C
Section Number  - 1      Family - DEFAULT
Section Length  -      30.00 LF
Section Width   -      75.00 LF
Section Area    -    3,250.00 SF
=====

-----
Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

PCI OF SECTION =    100                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS =    1
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =    1
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =    0
RECOMMENDED MINIMUM OF 1 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED =    0%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE      SEVERITY          QUANTITY          DENSITY %      DEDUCT VALUE

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD                RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY  RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.
OTHER               RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY A
Branch Number   - T21A
Section Number  - 1      Family - DEFAULT
Slab Length     - 25.00  LF
Slab Width      - 75.00  LF
Number of Slabs - 267
=====

-----
Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :          Overall Cond.:      F.O.D.:
-----

PCI OF SECTION = 87                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS = 15
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 11
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 7 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 9.770%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE    SEVERITY      QUANTITY      DENSITY %    DEDUCT VALUE
63 LINEAR CR      LOW          31 (SLABS)    11.79        9.69
66 SMALL PATCH    LOW          15 (SLABS)    5.64         0.57
67 LARGE PATCH    LOW          14 (SLABS)    5.13         3.17
74 JOINT SPALL    LOW          12 (SLABS)    4.62         2.06
74 JOINT SPALL    MEDIUM      1 (SLABS)     1.00         1.00
75 CORNER SPALL   HIGH         1 (SLABS)     1.00         1.20
75 CORNER SPALL   LOW          7 (SLABS)     2.56         1.01

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD              RELATED DISTRESSES = 52.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = 0.0 PERCENT DEDUCT VALUES.
OTHER              RELATED DISTRESSES = 48.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY E      Slab Length    -      25.00 LF
Branch Number   - T22C           Slab Width     -      25.00 LF
Section Number  - 1      Family - DEFAULT    Number of Slabs -      123
=====

-----
Inspection Date: 07/30/2002
Riding Quality :                Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:          F.O.D.:
-----

PCI OF SECTION =   99                      RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS =    7
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =    7
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =    0
RECOMMENDED MINIMUM OF  5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED =  2.556%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE    SEVERITY      QUANTITY      DENSITY %    DEDUCT VALUE
63 LINEAR CR      LOW          1 (SLABS)     1.00         1.00
75 CORNER SPALL   HIGH          1 (SLABS)     1.00         1.20

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD              RELATED DISTRESSES =   45.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES =    0.0 PERCENT DEDUCT VALUES.
OTHER              RELATED DISTRESSES =   55.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY F          Slab Length    -      25.00 LF
Branch Number   - T23C              Slab Width     -      25.00 LF
Section Number  - 1      Family - DEFAULT  Number of Slab -      60
=====

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Inspection Date: 07/30/2002
Riding Quality :                    Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

PCI OF SECTION =   91                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS =   3
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =   3
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =   0
RECOMMENDED MINIMUM OF   3 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 15.10%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE      SEVERITY      QUANTITY      DENSITY %      DEDUCT VALUE
63 LINEAR CR        LOW          1 (SLABS)      1.59            1.74
66 SMALL PATCH      LOW          5 (SLABS)      7.94            0.82
67 LARGE PATCH      LOW          9 (SLABS)     14.29           7.89
74 JOINT SPALL      LOW          1 (SLABS)      1.59            1.32
75 CORNER SPALL     MEDIUM       1 (SLABS)      1.59            1.07

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD                RELATED DISTRESSES =   14.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY  RELATED DISTRESSES =    0.0 PERCENT DEDUCT VALUES.
OTHER               RELATED DISTRESSES =   86.0 PERCENT DEDUCT VALUES.

```

```

Network ID      - Volk
Branch Name     - TAXIWAY C (SOUTH END)   Slab Length    -      25.00 LF
Branch Number   - T24C                   Slab Width     -      25.00 LF
Section Number  - 1      Family - DEFAULT  Number of Slabs -      25
=====

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Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :                      Overall Cond.: F.O.D.:
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PCI OF SECTION = 94                                RATING = EXCELLENT

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TOTAL NUMBER OF SAMPLE UNITS = 2
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 2
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 4 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 3.429%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
66 SMALL PATCH	LOW	1 (SLABS)	2.78	0.44
67 LARGE PATCH	LOW	3 (SLABS)	8.33	2.70
75 CORNER SPALL	LOW	1 (SLABS)	2.78	1.07

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD          RELATED DISTRESSES = 0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = 0.0 PERCENT DEDUCT VALUES.
OTHER         RELATED DISTRESSES = 100.0 PERCENT DEDUCT VALUES.

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```

Network ID      - Volk
Branch Name     - TAXIWAY A (CENTER)      Slab Length    -      125.00 LF
Branch Number   - T25A                    Slab Width     -      75.00 LF
Section Number  - 1      Family - DEFAULT  Number of Slabs -      15
=====

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Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

PCI OF SECTION =   97                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS =    1
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =    1
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =    0
RECOMMENDED MINIMUM OF  1 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED =  15.00%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE    SEVERITY      QUANTITY      DENSITY %    DEDUCT VALUE
74 JOINT SPALL    LOW          1.00 (SLABS)    6.67          2.56

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD              RELATED DISTRESSES =    0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES =    0.0 PERCENT DEDUCT VALUES.
OTHER             RELATED DISTRESSES =  100.0 PERCENT DEDUCT VALUES.

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Network ID      - Volk
Branch Name     - WEST ARM/DISARM APRON      Slab Length    -      15.50 LF
Branch Number  - A1B                        Slab Width     -      12.50 LF
Section Number - 1      Family - DEFAULT    Number of Slabs -      352
=====

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Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

PCI OF SECTION =   93                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS =   18
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =   12
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =    0
RECOMMENDED MINIMUM OF   6  RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED =   7.563%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE    SEVERITY      QUANTITY      DENSITY %    DEDUCT VALUE
62 CORNER BREAK   LOW              1 (SLABS)      1.00          0.70
66 SMALL PATCH    LOW             60 (SLABS)     17.11         2.20
66 SMALL PATCH    MEDIUM          3 (SLABS)      1.00          0.60
67 LARGE PATCH    LOW              4 (SLABS)      1.14          1.01
74 JOINT SPALL    LOW              5 (SLABS)      1.52          1.28
75 CORNER SPALL   LOW              5 (SLABS)      1.52          0.67
75 CORNER SPALL   MEDIUM          7 (SLABS)      1.90          1.26

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD              RELATED DISTRESSES =    9.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES =    0.0 PERCENT DEDUCT VALUES.
OTHER              RELATED DISTRESSES =   91.0 PERCENT DEDUCT VALUES.

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Network ID      - Volk
Branch Name     - HANGAR 504 APRON      Slab Length    -      20.00 LF
Branch Number  - A3C                   Slab Width     -      15.00 LF
Section Number - 1      Family - DEFAULT Number of Slabs -      56
=====

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Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
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PCI OF SECTION =      89                      RATING = EXCELLENT

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TOTAL NUMBER OF SAMPLE UNITS =      2
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =      2
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =      0
RECOMMENDED MINIMUM OF 2 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 15.00%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
66 SMALL PATCH	LOW	4.00 (SLABS)	7.14	0.72
73 SHRINKAGE CR	LOW	1.00 (SLABS)	1.79	0.80
74 JOINT SPALL	LOW	2.00 (SLABS)	3.57	1.84
74 JOINT SPALL	MEDIUM	2.00 (SLABS)	3.57	3.52
75 CORNER SPALL	HIGH	1.00 (SLABS)	1.79	2.83
75 CORNER SPALL	MEDIUM	2.00 (SLABS)	3.57	2.51

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD          RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES =      0.0 PERCENT DEDUCT VALUES.
OTHER         RELATED DISTRESSES =    100.0 PERCENT DEDUCT VALUES.

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Network ID      - Volk
Branch Name     - PARKING APRON NORTH
Branch Number  - A5B
Section Number  - 1      Family - DEFAULT
Section Length  - 2,500.00 LF
Section Width   - 125.00 LF
Section Area    - 312,500.00 SF
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Inspection Date: 07/30/2002
Riding Quality :           Safety:      Drainage Cond.:
Shoulder Cond. :           Overall Cond.:      F.O.D.:
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PCI OF SECTION = 67                                RATING = GOOD

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TOTAL NUMBER OF SAMPLE UNITS = 50
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 10
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 4.526%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
48 L & T CR	LOW	24,495 (LF)	7.34	20.07
50 PATCHING	LOW	4,023 (LF)	1.29	4.17
52 WEATH/RAVEL	LOW	312,500 (SF)	100.00	26.34

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	100.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - ALERT APRON
Branch Number   - A6B
Section Number  - 1      Family - DEFAULT
Slab Length     - 15.00 LF
Section Width   - 12.50 LF
Number of Slabs - 456
=====

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Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :          Overall Cond.:      F.O.D.:
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PCI OF SECTION = 87                                RATING = EXCELLENT

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TOTAL NUMBER OF SAMPLE UNITS = 23
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 11
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 19 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 29.12%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
61 BLOW-UP	LOW	41 (SLABS)	9.09	20.60
65 JT SEAL DMG	LOW	415 (SLABS)	90.91	2.00
74 JOINT SPALL	HIGH	2 (SLABS)	1.00	3.00
74 JOINT SPALL	LOW	10 (SLABS)	2.27	1.58
74 JOINT SPALL	MEDIUM	2 (SLABS)	1.00	1.00

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD          RELATED DISTRESSES = 0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = 80.0 PERCENT DEDUCT VALUES.
OTHER         RELATED DISTRESSES = 20.0 PERCENT DEDUCT VALUES.

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Network ID      - Volk
Branch Name     - ALERT APRON
Branch Number   - A7B
Section Number  - 1      Family - DEFAULT
Slab Length     -      15.00 LF
Slab Width      -      12.50 LF
Section Area    -      365
=====

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Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

PCI OF SECTION = 91                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS = 17
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 8
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 5.482%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE    SEVERITY      QUANTITY      DENSITY %    DEDUCT VALUE
62 CORNER BREAK  MEDIUM          2 (SLABS)      1.00          1.50
66 SMALL PATCH   LOW             115 (SLABS)    31.38          4.35
66 SMALL PATCH   MEDIUM          8 (SLABS)      2.13          1.18
67 LARGE PATCH   LOW              6 (SLABS)      1.60          1.47
67 LARGE PATCH   MEDIUM          2 (SLABS)      1.00          2.50
73 SHRINKAGE CR  LOW              2 (SLABS)      1.00          0.60
74 JOINT SPALL   LOW              6 (SLABS)      1.60          1.32
75 CORNER SPALL  LOW              2 (SLABS)      1.00          0.30

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD              RELATED DISTRESSES = 11.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = 0.0 PERCENT DEDUCT VALUES.
OTHER              RELATED DISTRESSES = 89.0 PERCENT DEDUCT VALUES.

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Network ID      - Volk
Branch Name     - TRIM PAD      Slab Length    -      20.00 LF
Branch Number   - A8B           Slab Width     -      20.00 LF
Section Number  - 1             Family - DEFAULT  Number of Slabs -      25
=====

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Inspection Date: 07/30/2002
Riding Quality :                Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

PCI OF SECTION =    61                      RATING = GOOD

TOTAL NUMBER OF SAMPLE UNITS =    1
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =    1
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED  =    0
RECOMMENDED MINIMUM OF    1  RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED =   15.00%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE      SEVERITY      QUANTITY      DENSITY %      DEDUCT VALUE
63 LINEAR CR        LOW          4 (SLABS)      16.00          11.94
63 LINEAR CR        MEDIUM       2 (SLABS)      8.00           16.11
72 SHAT. SLAB       MEDIUM       1 (SLABS)      4.00           16.80
73 SHRINKAGE CR     LOW          1 (SLABS)      4.00            0.96
74 JOINT SPALL      LOW          2 (SLABS)      8.00            2.92
74 JOINT SPALL      MEDIUM       1 (SLABS)      4.00            3.77

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD                RELATED DISTRESSES =    85.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY  RELATED DISTRESSES =     0.0 PERCENT DEDUCT VALUES.
OTHER               RELATED DISTRESSES =    15.0 PERCENT DEDUCT VALUES.

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```

Network ID      - Volk
Branch Name     - HANGAR 932 APRON      Slab Length    -    20.00 LF
Branch Number   - A9C                  Section Width   -    20.00 LF
Section Number  - 1    Family - DEFAULT  Number of Slabs -    38
=====

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Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :                      Overall Cond.: F.O.D.:
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PCI OF SECTION = 97                                RATING = EXCELLENT

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TOTAL NUMBER OF SAMPLE UNITS = 1
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 1
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 1 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 15.00%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
75 CORNER SPALL	LOW	3 (SLABS)	7.89	2.93

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	100.0 PERCENT DEDUCT VALUES.

```

Network ID      - Volk
Branch Name     - PARKING APRON EAST      Slab Length    -    25.00 LF
Branch Number   - A10B                   Section Width   -    25.00 LF
Section Number  - 1      Family - DEFAULT  Number of Slabs -    825
=====

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Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
-----

PCI OF SECTION =   95                                RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS =    42
NUMBER OF RANDOM SAMPLE UNITS SURVEYED =    18
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =    0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED =   5.185%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE      SEVERITY      QUANTITY      DENSITY %      DEDUCT VALUE
63 LINEAR CR        LOW          34 (SLABS)     4.17           4.05
66 SMALL PATCH      LOW          34 (SLABS)     4.17           0.47
67 LARGE PATCH      LOW           5 (SLABS)     1.00           0.75
73 SHRINKAGE CR     LOW           5 (SLABS)     1.00           0.60
74 JOINT SPALL      LOW           9 (SLABS)     1.11           0.82
75 CORNER SPALL     LOW          11 (SLABS)     1.39           0.61

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD                RELATED DISTRESSES =   55.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY  RELATED DISTRESSES =    0.0 PERCENT DEDUCT VALUES.
OTHER               RELATED DISTRESSES =   45.0 PERCENT DEDUCT VALUES.

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```

Network ID      - Volk
Branch Name     - HOT FUEL PAD      Slab Length    -    25.00 LF
Branch Number   - AllD              Slab Width     -    25.00 LF
Section Number  - 1      Family - DEFAULT  Number of Slabs -    124
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Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
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PCI OF SECTION =    76                      RATING = VERY GOOD

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TOTAL NUMBER OF SAMPLE UNITS =      6
NUMBER OF RANDOM SAMPLE UNITS SURVEYED      =    4
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =    0
RECOMMENDED MINIMUM OF  5  RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED =   15.67%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
62 CORNER BREAK	LOW	3 (SLABS)	2.63	2.28
63 LINEAR CRACK	LOW	31 (SLABS)	25.00	15.43
65 JT SEAL DMG	MEDIUM	33 (SLABS)	26.32	7.00
72 SHAT. SLAB	LOW	2 (SLABS)	1.32	3.23
73 SHRINKAGE CR	LOW	5 (SLABS)	3.95	0.95
74 JOINT SPALL	LOW	13 (SLABS)	10.53	3.61
74 JOINT SPALL	MEDIUM	3 (SLABS)	2.63	3.00
74 JOINT SPALL	HIGH	2 (SLABS)	1.32	4.22
75 CORNER SPALL	LOW	2 (SLABS)	1.32	0.57

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD          RELATED DISTRESSES =   52.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES =    7.0 PERCENT DEDUCT VALUES.
OTHER         RELATED DISTRESSES =   31.0 PERCENT DEDUCT VALUES.

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Network ID      - Volk
Branch Name     - PARKING APRON NORTH      Section Length - 2,240.00 LF
Branch Number   - A12B                    Section Width  - 50.00 LF
Section Number  - 1      Family - DEFAULT   Section Area   - 112,000.00 SF
=====

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Inspection Date: 07/30/2002
Riding Quality :           Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
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PCI OF SECTION = 67                                RATING = GOOD

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TOTAL NUMBER OF SAMPLE UNITS = 22
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 7
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 5 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 1.538%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
48 L & T CR	LOW	14,287 (LF)	10.08	23.38
52 WEATH/RAVEL	LOW	112,000 (SF)	100.00	26.34

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY	RELATED DISTRESSES =	100.0 PERCENT DEDUCT VALUES.
OTHER	RELATED DISTRESSES =	0.0 PERCENT DEDUCT VALUES

```

Network ID      - Volk
Branch Name     - PARKING APRON WEST      Slab Length    - 25.00 LF
Branch Number   - A13B                   Section Width   - 25.00 LF
Section Number  - 1      Family - DEFAULT  Number of Slabs - 762
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Inspection Date: 07/30/2002
Riding Quality :                      Safety:      Drainage Cond.:
Shoulder Cond. :      Overall Cond.:      F.O.D.:
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PCI OF SECTION = 92                                RATING = EXCELLENT

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```

TOTAL NUMBER OF SAMPLE UNITS = 39
NUMBER OF RANDOM SAMPLE UNITS SURVEYED = 18
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED = 0
RECOMMENDED MINIMUM OF 10 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 9.376%

```

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE	SEVERITY	QUANTITY	DENSITY %	DEDUCT VALUE
62 CORNER BREAK	MEDIUM	2 (SLABS)	1.00	1.50
62 CORNER BREAK	LOW	7 (SLABS)	1.00	0.70
63 LINEAR CRACK	LOW	20 (SLABS)	2.65	2.70
66 SMALL PATCH	HIGH	2 (SLABS)	1.00	2.00
66 SMALL PATCH	LOW	27 (SLABS)	3.53	0.45
66 SMALL PATCH	MEDIUM	4 (SLABS)	1.00	0.60
67 LARGE PATCH	HIGH	2 (SLABS)	1.00	4.00
67 LARGE PATCH	LOW	2 (SLABS)	1.00	0.75
67 LARGE PATCH	MEDIUM	2 (SLABS)	1.00	2.50
72 SHAT. SLAB	LOW	2 (SLABS)	1.00	2.50
73 SHRINKAGE CR	LOW	2 (SLABS)	1.00	0.60
74 JOINT SPALL	LOW	13 (SLABS)	1.76	1.41
75 CORNER SPALL	LOW	9 (SLABS)	1.18	0.47

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

```

LOAD          RELATED DISTRESSES = 37.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES = 0.0 PERCENT DEDUCT VALUES.
OTHER         RELATED DISTRESSES = 63.0 PERCENT DEDUCT VALUES.

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Network ID      - Volk
Branch Name     - TRIM PAD
Branch Number   - A14B
Section Number  - 1    Family - DEFAULT
Slab Length     -      20.00 LF
Slab Width      -      20.00 LF
Number of Slabs -      20
=====

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Inspection Date: 07/30/2002
Riding Quality :          Safety:      Drainage Cond.:
Shoulder Cond. :          Overall Cond.:      F.O.D.:
-----

PCI OF SECTION =   35                      RATING = EXCELLENT

TOTAL NUMBER OF SAMPLE UNITS =      1
NUMBER OF RANDOM SAMPLE UNITS SURVEYED =      1
NUMBER OF ADDITIONAL SAMPLE UNITS SURVEYED =      0
RECOMMENDED MINIMUM OF 1 RANDOM SAMPLE UNITS TO BE SURVEYED.
STANDARD DEVIATION OF PCI BETWEEN RANDOM UNITS SURVEYED = 15.00%

*** EXTRAPOLATED DISTRESS QUANTITIES FOR SECTION ***

DISTRESS-TYPE    SEVERITY      QUANTITY      DENSITY %    DEDUCT VALUE
62 CORNER BREAK   LOW          5.00 (SLABS)    25.00        18.00
63 LINEAR CRACK   LOW          3.00 (SLABS)    15.00        11.45
65 JT SEAL DMG    LOW         20.00 (SLABS)   100.00         2.00
72 SHAT. SLAB     LOW          3.00 (SLABS)    15.00        22.43
72 SHAT. SLAB     MEDIUM       2.00 (SLABS)    10.00        27.33
73 SHRINKAGE CR   LOW          6.00 (SLABS)    30.00         4.21
74 JOINT SPALL    MEDIUM       1.00 (SLABS)     5.00         4.38
75 CORNER SPALL   MEDIUM       1.00 (SLABS)     5.00         3.62

*** PERCENT OF DEDUCT VALUES BASED ON DISTRESS MECHANISM ***

LOAD              RELATED DISTRESSES =   85.0 PERCENT DEDUCT VALUES.
CLIMATE/DURABILITY RELATED DISTRESSES =    2.0 PERCENT DEDUCT VALUES.
OTHER              RELATED DISTRESSES =   13.0 PERCENT DEDUCT VALUES.

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14. ABSTRACT An airfield pavement evaluation was performed in August 2002 at Volk Field, Air National Guard (VFANG), Camp Douglas, Wisconsin, to develop information pertaining to the structural adequacy of the airfield pavements for continued use under its current mission and the upgrading of the pavements for mission changes. The pavement surface condition was evaluated using the Pavement Condition Index (PCI) survey procedure, and a nondestructive evaluation procedure was used to determine the load-carrying capability of the pavements and overlay requirements for continued use of the pavements under current missions. Results of the evaluation are presented including: (a) a tabulation of the existing pavement features, (b) the results of the nondestructive tests performed using a heavy weight deflectometer, (c) the PCI and rating of the surface of each pavement feature, (d) a structural evaluation and overlay requirements for 1,400 passes of the B-737 aircraft on the PCC pavements and 9,525 passes of the KC-135 aircraft on the AC pavements, (e) the pavement classification number for each pavement facility, and (f) maintenance and repair recommendations based on the structural evaluation and condition survey.					
15. SUBJECT TERMS Aircraft classification number Nondestructive testing Pavement condition index Allowable gross aircraft load Pavement classification number Volk Field, Air National Guard					
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